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CONSUMPTION

IN

AUSTRALIA.



C. E. REEVES, B.A., M.D.,

AUTHOR OF "HEART DISEASES AND ANEURISM IN AUSTRALIA," "DISEASES OF THE
STOMACH AND DUODENUM;" "DISEASES OF THE SPINAL CORD AND MEMBRANE;"
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"Nulla est alia pro certo noscendi via nisi quam plurimus et morborum et dissectionem
historias, tum aliorum, tum proprias, collectas habere, et inter se comparare."

Morgagni. De Sed, et Causis Morb, lib IV, proam.

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J. BROOKS, 232 BOURKE STREET. EAST, MELBOURNE.

1874.

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INTRODUCTION.

ON my arrival in the colony, in 1861, I was surprised to find how large a number of the cases in the Hospital were suffering from Disease of the Chest, particularly as I had been led to believe in England that it was unknown here. This is evidently still the opinion of a large number of the medical men in England, from cases in all the stages of consumption being sent out. The climate is decidedly more favorable than that of England for those suffering from lung disease who can change their residence according to the changes of the seasons.

Those in England who have had their families cut down, one after the other, by consumption, may even hope to see their children grow up here without the disease manifesting itself, and even wear it out in the second generation. *I would beg particularly to impress on the medical profession in England, that to send consumptive patients out to*

Melbourne under the idea that they will be able to earn enough to keep them and yet get well, is a mistake. To labour in a climate which is extremely enervating and variable, from the sudden fall in the temperature on the occurrence of the south wind in the warm months, renders those whose lungs are weakened by previous disease very liable either to general or partial congestion; the result being that in the former the patient dies in the course of a few days, and in the latter that the lung breaks up more or less rapidly, either consequent on pulmonary apoplexy or softening of the congestion, either with or without induration.

In studying the disease for nearly twelve months after my arrival, in the Melbourne Hospital, I was surprised to find that, instead of its being tubercular, as in Europe, it was more frequently inflammatory, and that it passed with more or less rapidity through the stages of congestion, induration and softening, followed by the formation of cavity. The result of these observations was embodied in a series of articles published in the *Medical Record of Australia* for 1861-2-3.

During the thirteen years I have been in the colony, I have carefully noted the history of all the cases—not less than from two to three thousand

in number—which have fallen under my notice, and traced the circumstances connected with each case, and, as far as possible, the after-death appearances. The great dislike to after-death examinations here has rendered many of the observations incomplete. I have, therefore, refrained from reporting them, particularly as my object has been rather to present a faithful history of the fatal cases, observing as carefully as possible the history during life and the changes found after death. During my early investigation of the disease, I was as I have just stated struck with the rarity of tubercular deposits in the lungs and other organs. As the climate becomes moister and colder—and most old residents think that this is taking place—tubercular diseases, or diseases of a tubercular type, are becoming more common, not only in the European but in the native born. It would seem that, with the increased cultivation, from the soil retaining the moisture more than it did, the temperature lessens and the air becomes more charged with moisture.

In referring to the Registrar-General's reports for ten years, it will be seen that there is a marked increase in the number of deaths from consumption. In 1859, with a population of 517,226,

the deaths amounted to 632 ; in 1868, with a population of 671,222, they had increased to 733.

The following table will show the number of deaths in the colony from consumption, and from all causes, from 1859 to 1868 inclusive, and the population :—

Year.	Consumption.		All Causes.		Population.
	M.	F.	M.	F.	
1859	370	262	5721	3748	517,226
1860	440	326	7134	4927	539,337
1861	443	310	6124	4398	541,025
1862	426	281	5900	4180	548,087
1863	419	298	5646	3856	561,322
1864	406	267	5202	3685	589,260
1865	436	292	6158	4303	616,375
1866	456	300	7016	5270	634,077
1867	448	331	6613	5120	649,821
1868	414	319	5865	4202	671,222

In conclusion, I must observe that here, as in England, diseases of the lungs should be treated as early as possible, and from the chief cause of them—whether consumptive, bronchitic, or asthmatic—being repeated colds, from exposure to wet and cold, living in damp houses or damp situations, a change of residence, either to a dry warm situation, or climate, should be early insisted upon, particularly in the wet and cold months.

C. E. REEVES, M.D.

119 COLLINS STREET, MELBOURNE,

October, 1874.

CONSUMPTION IN AUSTRALIA.

CHAPTER I.

Rarity of tubercular deposit in the lungs—How cavities usually form in the lungs—Various ways in which they form.

IN Europe tubercular deposits in the lungs, the changes which they undergo by softening and breaking up, resulting in the formation of cavity, is the rule, but in Australia it is the exception. During twelve years' active practice in the colony, with ample opportunities in observing cases of consumption from its commencement to its termination, I have seldom seen a case, as in Europe, where tubercles have been deposited, as for instance, in the apex of the lung, break up with severe bleeding, followed by cavity. Occasionally cases of chronic induration of the upper part of one or other of the lungs which have followed nearly the same course, as when tubercular deposits break up, are met with, namely, in the centre of the induration, a coarse wheeze has appeared, surrounded by a finer one on which it has gradually encroached, the other extending at the

same time, and both in such a regular manner that a person who has not taken the trouble to observe these alterations, would scarcely believe. It is in this way that a cavity forms as a rule in this climate, whenever the substance of the lung becomes congested, or the seat of an apoplectic clot.

In the former, the fine wheeze or crepitation becomes at one spot insensibly coarser until it assumes a rattle, becoming surrounded at the same time by a marked circle of crepitation; the phlegm at the same time changes from clear mucus or mucus tinged with blood or its colouring matter, to mucus-purulent, or purulent; while in the latter a clot of blood of greater or lesser size is effused into the substance of the lung, tearing it up and exciting inflammation. In these cases the same changes will be observed, the air passing through the clot produces a more or less coarse rattle: the expectoration consists of clots of dark blood as if from a branch of the pulmonary artery, or mixed with red blood, if from the pulmonary vein, and occasionally, when bronchial irritation exists, with more or less mucus. Around the clot, or where it existed, the fine wheeze appears and extends gradually, the cavity at the same time increases in size, and the phlegm becomes more and more purulent.

There is another form observed here.

A portion of the lung is struck with gangrene, from obliteration of some of the branches of the pulmonary artery, the diseased portion of the lung is absorbed, there is no expectoration, and in some cases no cough or

expectoration until the lung around the cavity becomes inflamed.

There are also other causes of cavity met with: one in which the patient after suffering for a considerable period from bronchitis, the walls of the bronchial tubes ulcerate; the second, in which the air cells dilate and contain mucus or mucopurulent fluid. In both these forms there is the gurgling sound on coughing existing in the course of the bronchial tube or in the dilated air-cells; but unless the lung becomes indurated, there is an absence of dulness on percussion and increased vocal resonance. The expectoration in both these forms is generally very copious. There is another form: when an hydatid cyst forms in the lungs; the contents being discharged into one of the bronchial tubes, its walls remain and secrete purulent matter. The fluid from an hydatid cyst in the upper part of the liver often finds its way through the diaphragm into the lungs, and produces all the symptoms of consumption.

It is not uncommon for the walls of the hydatid cyst to separate from the lung and be thrown up, and the patient recover; but sometimes the separation is incomplete. The vessels in the lung are laid open, and the patient may die from hæmorrhage from the lung. If the hydatid cyst should rupture and the fluid escape into the substance of the lung, severe inflammation and even gangrene from its extreme irritating nature may be excited.

I have known the separation of the cyst cause fatal hæmorrhage in the liver in several cases, and once in the

kidney. The liver is the organ in which hydatids most commonly form in the colony.*

It is not that tubercular deposits do not occur in the lungs in the colony, but as I have before observed, they are the exception, not the rule. If they occur, it is under the same circumstances as in Europe, continuous exposure to cold and wet. It is probable that in Melbourne and its vicinity, from the large quantity of water used of late years, rendering the atmosphere moister, that it will become more frequent. I have noticed during the last few years that a form of chronic inflammation of the lungs, closely allied to the tubercular, is becoming common.

In making *post mortem* examinations of the lungs during the last few years, I have several times found, when the lungs were softened, a cluster of the air-cells with the smaller bronchial tubes attached and indurated. This is a circumstance I have neither observed nor read of as occurring in Europe.

It is impossible to trace to what extent the different forms which have been enumerated contribute towards the formation of cavities in the lungs, from the majority of the cases rarely coming under treatment, until the debility and emaciation render them unable to work. The rapidity with which a cavity forms is often surprising and unsuspected.

* The relative liability of the different organs to hydatids stands thus :— In one hundred cases which have fallen under my notice, the lungs were the seat of hydatids in twelve of the number; the liver, in seventy; omentum and mesentery, in five; kidneys, in two; brain, spleen, eyes, breast, muscles and bones, in eleven.

I have repeatedly seen cases of congestion of the upper part of the right or left lung end in a cavity in from seven to ten days.

In describing the different forms of consumption as observed here, the following divisions will be found the most practical:—

- 1.—From acute inflammation and pulmonary apoplexy.
- 2.—From acute or chronic gangrene.
- 3.—From chronic inflammation and tubercles, followed by softening.
- 4.—From bronchitis, occurring in connection with chronic inflammation and breaking up of the lung or ulceration of the walls of the bronchial tubes.
- 5.—From hydatid cysts.

CHAPTER II.

Influence of the seasons in producing diseases of the lungs
—Increase of lung diseases, particularly asthma, in
Melbourne from the increased quantity of moisture in
the atmosphere—Tables of cases applying at the Insti-
tution for Diseases of the Chest—Analysis of the cases
—Tables of admissions and deaths in the Melbourne
Hospital—Deaths in Melbourne.

It might be expected that here, as in England, diseases of the lungs would be more frequent in the cold months of the year (May, June, and July) than in the hot months of December, January, and February. This is, however, not the case. The coldness of the seasons has less to do with exciting them than very sudden changes, attended with cold rains. In dry weather, whether cold or hot, there are always fewer cases and fewer relapses.

In the hot months, apoplexy and bleeding from the lungs are very liable to occur if the heat continues beyond the usual three days without a change in the weather.* Any sudden change or exposure to the night-air and heavy dew,

* It is not uncommon for the thermometer to sink from 117 deg. or 120 deg., on the change of the wind, to 50 deg. or 60 deg., and be attended with a cold rain which chills the sick and the delicate if not protected, as severely as if they had been plunged into ice.

is very apt, when the lungs are weak, or the patient exhausted by disease, to excite congestion of the lungs. The occurrence of several cold and wet days in succession, after several extremely hot days, is sure to be attended or followed by an influx of patients at the Institution, suffering either from bronchitis, congestion of the lungs, or an aggravation of their asthmatic or consumptive symptoms.

In a great number of the cases, the cause can be traced to carelessness on the part of the patients in leaving off flannels and exposing themselves to cold and wet, and sleeping out at night. The excessive use of cold bathing—remaining for a long time in the water—is often a source of lung disease. The effect of the too free use of the cold bath on delicate females and children is peculiar. It renders them pale and thin—the pulse weak, and reduces their strength. If continued for some time, mucous wheeze will be excited in the ultimate air-cells of the lungs. The sublingual temperature and the temperature of the breath are always lower in these cases than in health. In the hot months, colonial fever is more common, from the sudden chilling of the body, from exposure to cold while the body is covered with perspiration or insufficiently clothed, than in the milder ones. This fever, which may be said to take the place of the simple fever of Europe, is characterised by chills followed by a dry greasy skin, white tongue, passing into brown, if the patient is exposed to the effluvia of a badly-drained and overcrowded place—delirium generally occurring at night and not of a very active nature, scanty urine, thirst, and pulse

ranging from 116 to 130 and feeble. With these symptoms, the posterior and lower part of the lungs are sure to be found eongested either aetively or passively, and occasionally the upper part of the right or left lung. It is not possible to trace the period when the fever commences, from the patient not being always struek down at once, but only after repeated doses of the poison. If the dose received is large, and no attempt made to eneourage perspiration, about the sixth day the patient is inundated with it—the urine be-comes about the same time offensive from the presenee of some decomposed animal priniple. In some eases when the patients are compelled to work, the sweating continues for a long time, reduing them very much both in strength and flesh.*

In the very hot weather, patients suffering from disease of the heart are very liable to eongestion of the lungs and pulmonary apoplexy. Aeute suppression of the urine is often a cause of eongestion of the lungs in the hot weather. Patients suffering from disease of one lung are also very liable to eongestion of the opposite one, or to an extension of the congestion already existing around the eavity.

I have repeatedly notieed that if eolonial fever is prevalent in the hot weather, lung diseases are sure to be

* Females, particularly those who work hard, are liable before and after the cessation of the menstrual discharge, to a kind of ehronic eolonial fever. They get attacks of hot flushes followed by cold sweats—the urine is highly offensive, or if it is absent, the fæces—the pulse is quick and feeble, and the debility extreme. The poison of the fever often excites lung disease from its action on the lining membrane of the pulmonary artery. It seems to have a great deal to do with exciting other diseases.

common in the following winter. Again, if a child has had symptoms of irritation of the stomach with the slight cough and passive congestion of the lungs which nearly always attends it—in the winter bronchitis or broncho-pneumonia is very liable to occur. If either of these occur in the winter, softening of the stomach is nearly certain to occur in the hot weather, if the patient remains weak.

The climate of Melbourne varies very much; and the atmosphere, from the large quantity of water used in the town and in the suburbs for irrigating the land, has become very heavily charged with moisture. The effect of the latter is to reduce the mean temperature nearly two degrees. Last winter (1873) the fog was as dense as in London. The result of this increased quantity of moisture is to render bronchial disease and asthma more common than before the town was supplied with water. The effect of this increase in the amount of moisture is to render it a very bad residence for the consumptive. I have not seen any case do well in it for a long time. When I arrived in the colony in 1861, I was struck with the small amount of expectoration in the cases of consumption. This is not the case now, from a third to half-a-pint or a pint being often expectorated in the twenty-four hours; the amount depending on the existence of bronchitis. Cases in which the lung breaks up with but slight cough and no expectoration are now comparatively rare.

The following table will show the relative frequency of bronchitis, inflammation of the lungs, and consumption, treated at the Institution for Diseases of the Chest in the

different months for two years—January to December 1867, and August, 1872, to July, 1873 :—

	Chronic Bronchitis.	Consumption.	Total.
January	24	8	32
February	44*	36	80
March	27†	35	62
April	8	24	32
May	13	7	20
June	27	21	48
July	20	23	43
August	12	20	32
September	2	16	18
October	16	33	49
November	35	37	72
December	28	20	48

Table showing the number of cases of acute bronchitis, congestion of the lungs, pleuritis, chronic bronchitis and asthma, and consumption, treated in 1872-3 :—

	Acute Bronchitis.	Congestion of Lungs.	Pleuritis.	Chronic Bronchitis and Asthma.	Consump- tion.	Total.
1872.						
August	16	8	3	20	44	91
September ...	28	..	...	7	9	44
October	32	16	...	21	27	96
November ...	23	29	1	41	27	121
December ...	31	41	8	4	25	109
1873.						
January	44	21	2	40	21	128
February ...	16	20	...	17	31	84
March	68	44	4	15	29	160
April	32	...	8	39	29	108
May	60	5	7	40	28	140
June	48	4	6	37	21	116
July	68	8	...	52	16	144

In the first table, January, April, May, and September, were the months in which the fewest cases occurred. In

* Nine were recent cases, ranging from two to four months,

† Eight of the cases were recent.

that year there were but very few cases of asthma, but in 1872-3 there was a large number. This increase is due to the cause just named, and to cases of bronchitis extending to or commencing in the air-cells being nearly certain to produce asthma. In chronic cases of consumption, when the patients are obliged to wash and iron, and expose themselves more or less, asthma is nearly sure to exist.

In the second table for 1872-3, September and February were the months in which the smallest number of cases sought relief. I have noticed that other causes than atmospheric will cause an accession of cases, namely, epidemics of measles, scarlet fever, colonial fever,* hooping cough. Patients coming from New Zealand with lung disease, and the effect of the changeable weather in those in health coming from the warmer climates of New South Wales, South Australia, Queensland, &c., producing lung disease, help to swell the number of the applicants.

An analysis of the cases which occurred in the different months of 1872-3 may not be without interest:—

August: Of the twenty cases of chronic bronchitis and asthma, four were recent, ranging from six to nine weeks in duration, the remaining sixteen cases had suffered every winter or on sudden changes of the weather. Of the 44 cases of consumption—in 21 the disease was recent, under three months in duration; in 11, over three months and

* The crowding together of a large number of children under the new Educational Act in small badly-ventilated rooms, was attended with an outbreak of fever of a low type, with lung disease.

under six ; but in the remaining twelve cases it ranged from nine to twelve months.

September: The seven cases of chronic bronchitis and asthma were all old cases. Of the four cases of consumption, two were recent, the third, six months, and the fourth, twelve months. The acute cases were more numerous than in August.

October: The 21 cases of chronic bronchitis and asthma were old cases. Sixteen of the 27 cases of consumption were recent (under three months), the remaining eleven cases being chronic.

November: Of the 41 cases of chronic bronchitis and asthma, only eight were recent, and of the 27 cases of consumption, only four, the most recent being of six months' duration. The cases of acute bronchitis were fewer than in the previous month, being 23, while the cases of acute congestion were more numerous.

December: There were only four cases of chronic bronchitis and asthma. Heart disease existed in three of the cases. Of the 25 cases of consumption, only three were recent—the remaining 22 cases had lasted, 3 for 9 months, and 13 for 12 months.

January: Of the 40 cases of chronic bronchitis and asthma not one was recent. The cases of consumption were more recent than in December, twelve being of three months' duration; the remaining nine cases ranged from six to nine months. Acute bronchitis and congestion of the lungs were frequent.

February: Nearly the same was observed as in January ;

both consumption and chronic bronchitis were less frequent. There were also fewer cases of acute bronchitis and acute congestion of the lungs.

March: A large number of cases applied this month. The cases of acute bronchitis and acute congestion of the lungs were numerous, amounting to 112 out of the 160 cases. Colonial fever was common, and lung symptoms predominated more than usual. The fifteen cases of chronic bronchitis were of old standing, and only five of the cases of consumption were recent.

April: In this month, the patients suffering from acute bronchitis were not very young. There were fewer cases than in March, the numbers being 32 to 68. There were no cases of congestion of the lungs. Of the 39 cases of chronic bronchitis and asthma, twelve were relapses. Only three of the cases were recent, and these were complicated with chronic colonial fever. Several of the cases of consumption had relapsed and only four of the 29 cases were recent. The largest number of the cases of bronchitis, 40 out of the 68, occurred in the latter half of the month.

May: Of the 60 cases of bronchitis, 16 were complicated with hooping cough, and 4 with croup. There were only 5 cases of congestion of the lungs. Of the 40 cases of chronic bronchitis, 8 were relapses; several were suffering from disease of the heart. There were no recent cases. Several of the cases of consumption had suffered a relapse. Only 3 of the 28 cases were recent, and 5 were over three months and under six months in duration.

June: Of the 48 cases of bronchitis, sixteen were complicated with hooping cough, five with laryngeal and croupy symptoms. Of the 37 cases of chronic bronchitis and asthma, several were relapses. There were no recent cases. Of the 21 cases of consumption, 16 were recent.

July: Of the 16 cases of consumption, all were recent. Of the 52 cases of chronic bronchitis and asthma, 17 were relapses; the most recent case had existed six months. Of the 68 cases of bronchitis, 12 were complicated with hooping cough. The majority of the remaining patients were young—under three years of age.

Table showing the number of admissions into the Melbourne Hospital from 1850 to 1867, a period of 18 years—from all diseases, and diseases of the lungs.

Year.	No. of cases of all Diseases.	No. of cases of Disease of Lungs.
1850*	189	14
1851	222	10
1852	547	21
1853	1423	91
1854	1460	137
1855	1449	195
1856	1550	134
1857†	1683	169
1858	2013	269
1859	2967	384
1860	3628	500
1861	4309	541
1862	3179	330
1863	3147	364
1864	3024	351
1865	3253	422
1866	3300	491
1867	3095	387

* Compiled from the Hospital Books. † Compiled from the Annual Reports.

Influence of sex and age in predisposing to the disease.—

It can be readily understood from the greater proportion of males, that in the early days of the colony, the number admitted into the Hospital suffering from lung disease was greatly in excess of the number of females. I have examined the Hospital books from 1850 to 1860. In the first half of this period there were 185 males admitted to 35 females, and in the second half, 257 males to 57 females.

Of the 185 males admitted during the former period, 52 were between 20 and 30 years of age; during the latter, of the 257 admitted, 155 were between 20 and 35. Of the females, 26 out of the 35 were between 20 and 30 years of age, and of the 57, 38 were between 15 and 30.

Before 1857, the mortality among the patients was very great, particularly in 1850 and 1851, when 12 out of 18 died. In the next two years, 1852 and 1853, it diminished slightly, and up to 1857, it remained stationary, when it again lessened. The same occurred in 1859.

The following table will show the number of cases admitted, and the deaths, from 1850 to 1860 inclusive:—

Of 18	cases	admitted	in 1850 and 1851,	12	died.
" 47	"	"	1852 and 1853,	28	"
" 55	"	"	1854,	32	"
" 107	"	"	1855,	65	"
" 85	"	"	1856,	46	"
" 35	"	"	1857,	19	"
" 47	"	"	1858,	26	"
" 84	"	"	1859,	37	"
" 59	"	"	1860,	27	"

On analysing these cases with reference to the periods of

life when the mortality was most pronounced, I found that during the first five years of 1850-1860 the mortality was never at any period of life less than one-half, nor during the second never less than one-third. During the first period the mortality among males was greatest from the 20th to the 39th year, 95 out of 121 cases admitted dying; it was also strongly pronounced from the 40th to beyond the 50th year, 17 out of the 34 cases admitted dying. During the second period the mortality from the 15th to the 24th year was less than at any other period of life, death ensuing in 25 out of 75 cases admitted; but out of 156 cases admitted from the 25th to the 39th year, death ensued in 84 of the number. Then it diminished somewhat, only 14 cases out of 26 admitted after the 40th year terminating fatally.

Among females, the mortality during the first 5 years of 1850-1860 was very great between the 15th and the 19th year, 3 out of the 4 cases admitted died; from the 20th to the 24th, 7 out of 16 cases admitted died; but from the 25th year death ensued in all the cases admitted, 15 in number. In the second five years there was a marked diminution in the number of deaths. Of 11 cases admitted between 15 and 19 years, death ensued in 3 of the number; of 16 between 20 and 24, death ensued in 6; and of 8 between 30 and 34, in 2; but of 11 between 25 and 29, death ensued in 6, and in 4 out of 5 between 35 and 39.

In the first five years of 1850-1860, death ensued in 117 out of the 185 males admitted, and in 25 of the 35 females admitted. In the second five years, death resulted

in 123 of the 257 males admitted, and in 24 of the 57 females.

In the early period of the settlement of the colony a large number of the cases admitted into the hospital were suffering from dysentery brought on by exposure to cold and wet, drinking bad water, and living in badly-constructed and over-crowded rooms, or in tents or bushes drawn together, or bark huts in the native fashion, and sleeping on the ground. Both among the natives and Europeans, drunkenness and lying out on the ground at night have been the most frequent causes of consumption.

With better dwellings and purer water, dysentery has ceased to be the scourge it was in the early times.

I have not examined the hospital books for the last ten years, namely, from 1861 to 1870, as I do not think they are reliable as to the number of deaths, as of late years a very large number of the hopeless cases leave or are dismissed if they have homes or friends to take charge of them.

Influence of Length of Residence in the Colony in predisposing to the disease and causing it to Terminate Fatally.

From the hospital records I found that 1854 and 1855 are the only years in which the length of residence is given in the hospital books, in 1856, and subsequently only the year the patients entered the colony is noted.

In 1854 and 1855, the largest number of cases were admitted during their first year's residence, being respectively

29 and 44; and during their second year's residence, 12 and 24. These were the largest numbers ever admitted during their first and second year's residence. In 1856 and 1858, the largest number of eases was admitted during their second year's residence—being respectively 10 and 9—but in 1859, the largest number entered during the third and fourth years of their residence—the numbers being 20 and 13.

During the first, second, third, and fourth years of residence, the mortality in the 10 years was high—death ensuing in 66 of the 113 eases admitted during the first year; in 43 of the 77 during the second; in 25 of the 45 during the third; in 20 out of 34 in the fourth. During the fifth year's residence, only 9 out of 23 died; during the sixth, 12 out of 21; during the seventh, 6 out of 18; during the eighth, 6 out of 14; during the ninth, only 2 eases were admitted—no death; but of 41 who had resided more than nine years in the colonies, death ensued in 27 of the number.

The mortality has always been more pronounced among the new arrivals, than among those who had been in the colony some months. Of 13 new arrivals, or who had been less than 3 months in the colony, admitted in 1854—7 died: of 17 in 1855—12 died; of 5 who had been in 1854, from 3 to 6 months—1 died; and of 10 in 1855—5 died; of 10 who had been in 1854, from 6 to 12 months—5 died; and of 19 in 1855, 11 died.

In 1861, I collected in the hospital wards and in private practice, the length of residence of 210 eases, with the exception of 12 who were born either in this or in the adjacent

colonies; 6 (4 whites and 2 blacks) were natives of the United States; the remaining 198 were natives of Europe. With reference to their length of residence in the colony—of 192 cases, 18 had been here from 3 to 12 months; 21, from 6 to 7 years; 27, from 7 to 8 years; and 39, 9 years and more. It will therefore be seen from these cases and the hospital records, that a lengthened residence is no protection against the occurrence of consumption.

The following table will show the length of residence of the 192 cases:—

12 were new arrivals, or had been less than 3 months.*					
3	had been	...	...	3	"
9	had been from	...	...	6 to 9	"
6	"	"	...	9 to 12	"
9	"	"	...	1 to 2	years.
6	"	"	...	2 to 3	"
15	"	"	...	3 to 4	"
12	"	"	...	4 to 5	"
15	"	"	...	5 to 6	"
21	"	"	...	6 to 7	"
27	"	"	...	7 to 8	"
18	"	"	...	8 to 9	"
39	"	"	...	9 and beyond.	‡

1854 and 1855 are the only years in which the length of the residence of those admitted into the Hospital is noted. Of the 29 who entered in 1854, during the 1st year of their

* These had either brought the disease from England, or they had suffered from disease of the lungs there, and from exposure to wet and cold in coming round the Cape, more or less acute symptoms had been excited—in some of the cases, scurvy, more or less marked, existed. Most of the cases arrive here in June, July, and August.

† 18 twelve months and less.

‡ A large number of these were from other colonies, where they had been for periods varying from 3 to 12, or 20 years.

residence, 11 were new arrivals, or had been less than 3 months; 6 from 3 to 6 months; 2 from 6 to 9 months; and 8 from 9 to 12 months.

Of the 44 who entered during the 1st year of their residence, in 1855—17 were new arrivals, or had been less than 3 months in the colony; 11 from 3 to 6 months; 4 from 6 to 9 months; and 15 from 9 to 12 months.

The following table will show the length of residence of the cases of consumption admitted into the Hospital during 7 years, 1854 to 1860, and the number of deaths:—

During 1st year's residence.	1854	1855	1856	1857	1858	1859	1860	Total.
No. of cases admitted.....	29	44	5	7	8	10	10	113
No. of deaths	18	28	3	3	6	4	4	66
2nd year's residence.								
No. of admissions	12	24	10	7	9	8	7	77
No. of deaths	10	15	4	3	4	3	4	43
3rd year's residence.								
No. of admissions	1	8	2	6	3	20	7	45
No. of deaths	1	6	1	3	1	8	5	25
4th year's residence.								
No. of admissions	1	3	3	5	5	13	4	34
No. of deaths	0	2	2	3	3	7	3	20
5th year's residence.								
No. of admissions	0	3	3	2	6	6	3	23
No. of deaths	0	2	2	1	4	0	0	9
6th year's residence.								
No. of admissions	1	1	1	1	6	7	4	21
No. of deaths	1	1	0	1	3	3	3	12
7th year's residence.								
No. of admissions	0	0	0	2	2	6	8	18
No. of deaths	0	0	0	2	1	2	1	6

	1854	1855	1856	1857	1858	1859	1860	Total.
During 8th year's residence.								
No. of admissions	0	3	1	2	0	5	3	14
No. of deaths	0	2	0	0	0	3	1	6
9th year's residence.								
No. of admissions	0	0	0	0	0	0	2	2
No. of deaths	0	0	0	0	0	0	0	0
Beyond the 9th year.								
No. of admissions	3	13	5	5	5	9	1	41
No. of deaths	3	9	3	3	4	5	0	27
Total of admissions	44	99	30	37	44	84	49	
Total of deaths	33	65	15	19	26	35	21	

At present from the influx of natives of Europe being small in number, most of the cases of consumption which come under notice are under 20 or 25 years of age. Natives of New South Wales, Queensland, and South Australia are more susceptible to lung diseases here than even the natives and Europeans.

*Influence of the Periods of the Year on Patients Arriving in the Colony in causing the disease to terminate fatally—
On the admissions into the Hospital and on the Mortality.*

The best period of the year for consumptive patients to arrive in the Colony is either November, December, or January. This arises from their having favourable weather throughout the voyage, and arriving here in the hot months. Of 95 persons who landed in the colony with consumption 12 entered the Hospital in the month of January, of these 1 died; 6 in the month of February, of these 3 died; 9 in the months of March, April, May, June, and July—all of these

died; 21 in August, of these 15 died; 11 in September, of these 7 died; 13 in October, of these 12 died; 12 in December, no death took place.

It was not always possible to trace the causes which influence a fatal termination. In some instances the patients exposed themselves while suffering from the heat to cold, which excited an attack of colonial fever or congestion either of the lung affected, or of the opposite one. The climate being comparatively warmer than England but liable to greater and more sudden changes of temperature—people both healthy and consumptive often render themselves liable from carelessness as to the clothing they wear—subject to sudden chills, colonial fever with more or less congestion of the lungs being excited in the former, and congestion around the tubercular deposit in the latter, or in the opposite and previously healthy lung. Exposure to wet and cold on the voyage often aggravates the symptoms which were perhaps slight or better when the patients left England. When these were combined with bad food, scurvy was often excited; they generally hastened the fatal termination.

The lungs in this climate, both in health and disease, are very liable to become congested in the hot weather, either from exposure to cold and wet or in connection with colonial fever, and to apoplexy. The admission into the Hospital and the deaths therefore undergo but very little alteration. In the months in which the temperature has been equal and dry, fewer cases of lung disease occur than when the weather changes suddenly from extreme heat to

extreme cold, or to cold and wet. The occurrence of a few days of variable weather will often cause cases to end fatally which would have otherwise lived some time. If colonial fever has been common during the hot months, lung diseases will be sure to be prevalent in the cold ones. I have repeatedly noticed that cases of acute or subacute congestion which have existed in the summer are liable to breaking up of the lung in the cold weather. This is very liable to occur if the upper part of the lung is affected. The lower part of the lungs, when the congestion lasts some time, has a greater tendency to become indurated than softened, but the reverse is the case when the upper lobes are affected.

The following tables may not be without interest:—

Showing the number of admissions into the Hospital, and deaths from consumption, pneumonia, congestion of the lungs, and bronchitis, in the different months for 6 years, 1850 to 1856 inclusive, compiled from the hospital books.

	Consumption.		Pneumonia & Congestion of Lungs.		Bronchitis.	
	No. of Admissions.	No. of Deaths.	No. of Admissions.	No. of Deaths.	No. of Admissions.	No. of Deaths.
January	29	14	12	4	6	0
February	20	12	12	3	7	3
March	23	19	9	4	6	3
April	17	9	3	2	3	1
May	26	13	14	3	5	2
June	31	24	13	4	5	0
July	31	21	32	8	4	0
August	37	22	13	7	9	0
September	45	21	10	3	4	0
October	34	14	9	1	3	0
November	18	8	2	0	7	3
December	37	19	15	6	4	0
Total	348	196	144	45	63	12

Compiled from the Registrar-General's Returns of the Vital Statistics of Melbourne and Suburbs, from November, 1860, to October, 1861; of the number of deaths in each month, from consumption, pneumonia, and bronchitis, and all causes.

	Consumption.	Pneumonia	Bronchitis.	Total in each month
January	27	13	5	45
February	30	7	4	41
March	18	13	4	35
April	28	9	8	45
May	44	11	5	60
June	25	19	8	52
July	27	7	10	44
August	31	11	8	50
September	23	21	16	60
October	25	16	14	55
November	27	34	19	80
December	26	22	12	60
Total	351	183	113	627

Compiled from the Registrar-General's Reports from May, 1871, to April, 1872.

	Consumption.	Haemoptysis.	Laryngitis.	Bronchitis.	Pneumonia.	Pleuritis.	Congestion of Lungs, &c.	Asthma.	Lung Diseases.	All Causes.
May	39	...	...	11	6	4	6	1	1	316
June	40	...	1	15	20	6	6	3	3	330
July	39	3	3	18	8	4	1	1	1	273
August	48	1	...	15	10	1	10	1	2	275
September	42	...	1	19	6	2	3	...	4	280
October	45	...	...	11	9	1	6	...	1	277
November	37	1	...	3	9	1	...	1	3	284
December	37	1	...	3	5	3	...	...	2	384
January	31	1	1	3	8	5	3	1	1	471
February	31	...	...	6	3	1	4	...	...	371
March	26	1	...	4	3	2	7	1	2	343
April	26	...	2	7	7	2	1	1	1	327

CHAPTER III.

Influence of the tubercular tendency in 205 cases—Causes of the disease in 165 cases—Hereditary tendency—Relative liability of the natives and Europeans.

INFLUENCE OF THE TUBERCULAR TENDENCY.—In 1861 I noted the previous history of 205 cases and that of their relatives with reference to the presence or absence of any tubercular tendency. It existed either in themselves or in their families in only 72 of the number; in the remaining 165 cases, no serofulous tendency could be distinctly traced. Exposure to cold after cold, colonial fever and diseases of the heart were the most frequent causes of consumption of the cases then met with. Very few were natives of this or the other colonies. The same exciting causes acted in those predisposed to consumption, as in those who were not so, namely, exposure to cold and wet, working in damp ground as miners, sleeping in tents or on the ground in damp clothes, chills from leaving off flannel on very hot days and not putting them on before the cold wind set in; passing from hot rooms into the cold night air is a frequent cause of consumption among youths. Families living in damp cold houses or situations may lose several of its members from the disease, particularly if they are naturally delicate. I

have known two, three, four, and even five die from this cause. In noting the cause of the disease in 165 cases:—

In 81 it arose from exposure to cold and wet, working in or sleeping on damp ground exposed to the night air.

In 48, to sleeping in iron houses, huts or tents, or damp rooms.

In 21, to colonial fever, the congestion of the lungs which existed with it causing the lung at the time to break up, or subsequently from exposure to cold and wet.

In 3, after scarlet fever, from exposure to cold when the skin was desquamating.

In 12, it occurred after confinement or miscarriage. Exposure to wet or cold was the cause in all these cases. A large number of females here get out of bed too soon after confinement, and begin to wash and work while in a weak state. The result of this is that they get cold after cold until the lung at length breaks up.

HEREDITARY TENDENCY.—Of the 72 cases in which the state of health of the parents and relations could be traced:—

In 12 the fathers had died, or suffered from disease of the lungs, generally consumption.

In 13, the mother.

„ 5, both father and mother.

„ 18, brothers or sisters.

„ 9, fathers and brothers, or sisters.

„ 9, mothers and brothers, or sisters.

„ 6, fathers and mothers, and brothers or sisters.

The patients who had lost father and mother, or father or mother, and brother and sisters, had generally had disease of the lungs before they left England.

RELATIVE LIABILITY OF THE NATIVE AND THE EUROPEAN TO THE DISEASE.—In 1861, few of the residents over fifteen years of age had been born here. Now, in 1873, the reverse is the case, and most of the cases under 25 years suffering are natives either of this or one or other of the adjacent colonies. Those born or who have resided for some time in South Australia, New South Wales, or Queensland, are more liable when they come to Melbourne, to lung disease, than the natives and those born in Europe. Quite 80 per cent. of the consumptive cases who sought relief at the Hospital for diseases of the chest in 1873 were colonial born, or they had been brought to this colony when very young. This diminution in the number of Europeans must be attributed to the cessation of immigration. In 1861, I examined the Hospital Books for the place of birth of 314 cases admitted during seven years. Of this number, 292 were natives of Europe—the majority from Ireland; the natives of England and Scotland being next in number; then the natives of Germany; then those of Sweden and Denmark; France and Italy contributing only a few. Only 11 were born in the colonies, 7 in the United States, 2 in Manilla, 1 in China, and 1 in the West Indies.

The rapidity of growth of those born in the colonies, many of them springing from children into men and women, and becoming parents at an early age, renders both sexes, if

exposed to cold and wet, very liable to consumption. There is a marked increase in Melbourne of diseases of a scrofulous type; and in time, unless some restraint is placed on the wasting of the water supplied to the town, and the overcrowding of the dwelling houses, we may expect to find tubercular deposits nearly as common as in Europe.

CHAPTER IV.

Pulmonary Apoplexy—Its influence in causing Consumption—Cases.

HERE as in Europe the indurated lung never becomes the seat of an apoplectic clot. In both climates, and more especially in this, the lung in the vicinity of the induration may do so, or the opposite and previously healthy lung may be affected with congestion; and, from weakness of its tissue blood effused, which may tear it up more or less and even find its way into the pleural cavity. The clot or clots of blood thus effused may produce suppuration, which either escapes into the bronchial tube or remains and forms cysts in which the elements of blood or pus will be found. It is very difficult to trace the manner in which the cavity usually forms, as the patient seldom seeks medical aid until compelled to do so from the weakness and emaciation, the cavity being then of a large size. Patients will often state that they first spat up a dark clot of blood followed by fluid blood in a greater or lesser quantity, and then matter alone or mixed with it. The usual history of a case of this kind is, that from exposure to cold and wet or in connection with colonial fever the apex of the lung becomes congested and with it there is a painful spot immediately below the clavicle, in which there is either no respiratory sound or

erepitation heard. If the latter exists the clot and with it more or less fluid blood is nearly certain to be expectorated but if it does not the clot may be either absorbed or become encysted in the same manner as in the brain and spinal cord or any other organ. These cysts are sometimes mistaken for hydatids. They differ in many ways, as will be seen when the subject of hydatids of the lung are referred to. Laennec* considered that the inferior lobe and the posterior part of the middle lobe were more liable to become the seat of elots than any other part of the lung. He also considered that blood was more likely to be effused in connection with disease of the heart than with consumption.

In this climate, pulmonary apoplexy is very liable to occur in connection with disease of the valves of the heart, particularly in very hot weather. It is then one of the most frequent causes of death. It would seem that the walls of the vessels and the tissue of the lung are then weaker than in cold weather, and therefore less able to bear any undue strain if eongestion should take place either from sudden exertion or from chilling of the surface of the body when the weather changes suddenly from extreme heat to extreme cold. I have known pulmonary apoplexy excited by plunging into very cold water and remaining there for some time when the patient was heated and exhausted on a very hot day. The lung was also congested in this case. The patient died ultimately from consumption.

* De L'auscultation, 1381, Paris, 1826.

CAUSES OF PULMONARY APOPLEXY.—It is not easy to trace all the circumstances connected with pulmonary apoplexy and the subsequent development of consumption. I have repeatedly seen cases in which the chest has been crushed, severe spitting of blood has then followed, and later, from cold and exposure to wet, consumption. In another case a spicula from a fractured rib was driven into the upper part of the lower lobe of the right lung, severe and continuous spitting of blood occurred, and then an abscess formed involving this lobe and the whole of the under part of the middle lobe. An abscess capable of holding a pint of purulent matter was found after death. For six weeks before death a large quantity of pus had been expectorated daily. The patient had spat up with the first gush of matter a small piece of bone. The sixth and seventh ribs were corroded and formed the outer wall of the abscess.

These are other more frequent causes of pulmonary apoplexy, namely:—

- 1.—Disease of the pulmonary veins.
- 2.—Disease of the heart.
- 3.—Softening of the tissue of the lung and the walls of the pulmonary vein occurring in connection with congestion.
- 4.—Gangrene of the lung.
- 5.—Hydatids.
- 6.—Aneurism of the aorta.

1. *Disease of the pulmonary veins.*—In colonial fever and acute albuminaria, the lining membrane of the

heart and the pulmonary vein will be found congested. In the branches of the vein, fibrinous clots, more or less discoloured with blood or distinct, will sometimes be found. With these changes, the surrounding lung tissue will be often congested, softened, or indurated, according to the length of time the clot has existed and the degree of irritation it excites. The cause of this inflammation does not always occur in the larger divisions of the vessel near the heart, but on the surface of the lung, extending inward towards the centre and roots of the lobes. In looking over my notes I have found several cases in which with symptoms of pleuritis, the pulmonary artery has become involved.

2. *Disease of the heart.*—Whenever the passage of the blood through the valves of the heart is obstructed, pulmonary apoplexy is very liable to occur in hot weather. If a clot of blood is retained, it may produce congestion and subsequent softening. The congestion may precede the effusion of the clot or both occur together.

The occurrence of pulmonary apoplexy in congestion and softening of the lung and in gangrene, depends on the walls of the vessels becoming softened.

The rupture or separation of an hydatid cyst from the tissue of the lung may lay bare a large vessel, and more or less hæmorrhage take place into the space filled by the hydatid cyst. In a case in which the cyst ruptured, the patient, after lifting a heavy log of wood, felt something give way in his chest, and immediately afterwards quite half a pint of clear saltish-tasted blood was expectorated.

He felt faint, and soon after brought up a large quantity of blood. He was carried home. Blood was again brought up in the course of an hour. This continued to take place for the next seven or eight days, at irregular intervals, varying from one to two or three hours, and without much cough. It was preceded by a sense of weight and fulness just above and to the left of the heart. Ice with large doses of acetate of lead and gallic acid seemed to check the quantity of blood for a short time. After death, in the centre of the right lobe of the lung there was a clot of blood of the size of a large hen's egg, and with it there was a flaccid hydatid cyst as large as a small orange, and quite capable of holding from three to four ounces of fluid. The wall of the cyst was quite fibrous. It had separated for more than two-thirds of its extent from the lung, exposing a large vessel of the size of a crow-quill. In the other case there was a large quantity of offensive saline fluid expectorated, followed by a dense cyst three inches long and one and a-half inch broad. The hæmorrhage was very severe for the first seven days, then pus gradually appeared mixed with the blood, and with it fever at night. There was fine crepitation in the apex of the right lung, extending over an area scarcely as large as the palm of the hand, with gurgling sound in the centre. The cavity became more and more marked, and extended towards the right edge of the sternum. Frequent attacks of hæmorrhage occurred which reduced the patient very much, and he at length sank from exhaustion at the end of

four months. There was a large cavity in the apex of the right lung. It was surrounded by condensed lung. The rest of the lung was reduced in size and slightly indurated. The left lung was enlarged and gorged with serum. These cases presented peculiarities not usually met with, from the hæmorrhage continuing after the incomplete separation of the cyst in the first case, and the occurrence of consumptive symptoms in the second. Generally the lung contracts on the expulsion of the fluid in the cyst, and although the interior of the cyst may secrete purulent matter, still if it is expelled, the lung contracts and the patient recovers.

Aneurism of the aorta.—If the lung forms adhesions with the aneurismal sac, when the latter bursts, the lung may be torn, the blood finding its way into the bronchial tubes. I have seen lately a case of this kind in a patient with aneurism of the aorta near the left side of the arch. The upper and middle lobes formed a large pouch containing torn lung, clots of blood, and fluid blood to the amount of a pint. The hæmorrhage from the mouth, which was distinctly arterial, was not very great. A considerable quantity of blood existed in the gullet and in the stomach. He was found dead in bed.

The following cases are the best I have been able to collect to illustrate the foregoing observations on pulmonary apoplexy and its influence in producing consumption.

Sometimes pulmonary apoplexy is followed by the formation of minute abscesses in the lungs. These cases differ

from those usually met with, where the effused clot excites inflammation in the surrounding lungs, followed by the escape of the blood into a bronchial tube and the formation of cavity. I am not prepared to say that these minute abscesses are always the result of apoplectic clots. In the following case there were several old apoplectic cysts. The patient, a male, aged 22, a ship's cook, entered the hospital July 13. His health had been good up to eighteen months ago, when he was seized with ague in China. This rendered him weak. He had since been liable to the attacks of ague from time to time, whenever he got wet. Three months ago he came to this colony, and then, from living too freely and exposure to cold, he spat up a considerable quantity of black blood—both fluid and clotted. He has been confined to bed since this. His face was pallid—emaciation marked—cough not very severe, with expectoration of purulent matter. In the apex of the right lung there was a cavity, but not of very great extent. Throughout this lung there was irregular dulness on percussion, but without increased vocal resonance. This state existed in both lungs. The most peculiar feature was the increasing emaciation, attended by a constant sense of coldness, with a distinct attack of cold chills at night, lasting for an hour, but without any subsequent reaction. The spleen, during the attack of cold shivering, increased in size somewhat. He got gradually weaker, and died on the 5th of August. There was a cavity in the apex of the right lung, but the lung around it was but slightly indurated. Both lungs contained a large number of small

abscesses. In the apex of the left lung there were several cysts which contained the remains of altered blood. There were no traces of tubercles. In a female, aged 50, living in a damp house, and who died without either cough or expectoration, the lungs were full of small abscesses. She had had an attack of spitting of blood, with difficulty of breathing, and weight in the chest. She died of exhaustion at the end of four months. I have noticed several other cases of a similar nature occurring in patients reduced in strength by bad food. In each case an attack of spitting of blood preceded the symptoms of debility, but these were the only two in which I could examine the state of the lungs after death.

Disease of the Heart—Cold, followed by Congestion of the Lungs—Pulmonary Apoplexy—Alteration in the Aortic Valves—Hypertrophy—Effusion into the Pericardium—Death.

Male, aged 27, a cab-driver, entered the hospital on the 10th of October. His health had been good until three months ago, when he began from a severe cold to cough and spit up a little thick, clear phlegm. A week ago his breathing became difficult, and his heart began to palpitate, and the phlegm to be tinged with blood. His face was pale; skin greasy, and warmer than natural; pulse, 120, full and hard; slight cough, with expectoration of mucus, tinged with blood and clots of blood; hands and feet oedematous. He could not lie down. He has never had rheumatism.

Two years ago he had syphilis, and now there are some copper-coloured spots on the body. Urine natural, and free from albumen. General crepitation existed in both lungs, with some dulness in the upper part of the right one, but without increased vocal resonance. He complained of slight pain in the region of the heart. The dulness in the region of the heart was six fingers' breadth deep and six across. The heart's impulse was not very much increased; it was more marked when he was made to lie on the left side. There was a loud, harsh murmur, approaching to rasping, over the aortic valves. He had never had either palpitation or difficulty of breathing, until a week ago. There was no change in the symptoms. He died on the 15th, five days after his admission.

Both the lungs were very much congested and gorged with serum, and in the apex of the right one there were five or six apoplectic clots, varying in size from a filbert to a walnut, situated nearly close together. The lining membrane of the bronchial tubes was congested and covered with mucus, tinged with blood. The right arm and leg were œdematous. The pericardium contained five ounces of serum. Near the apex of the heart some long cellular bands passed to the pericardium. The heart was distended with blood; the walls of the left lateral ventricle were thickened, and its lining membrane and that of the left auricle were dense. The aortic valves were thickened and cartilaginous, and the aorta throughout the thoracic region was studded with ætheromatous deposits. The mitral valve and the lining

membrane of the right ventricle and auricle presented no alteration. The liver and kidneys were very much congested. In a case similar to this the patient recovered from the attack of congestion, but the apoplectic clots broke up, a cavity formed, and he died, at the end of 14 weeks, of consumption. The pericardium was adherent to the heart by a fine layer of cellular bands, not unlike wool; the aortic valves were thickened and cartilaginous. The right lung was thickened and of a whitish-blue colour in its upper half; its upper lobe contained an irregular cavity. In the first case it was difficult to determine whether the pulmonary apoplexy occurred before the congestion or subsequent to it. The lung in the immediate vicinity of the clots was not more congested than in the other parts. In the second case, the clot existed with the congestion on admission. The whole of the right lung was affected. Gradually the lower lobe cleared; signs of induration existing in the upper part of the lung except at the apex of the upper lobe, where the clot became surrounded by a coarse râle, and the blood intermixed with purulent matter; later, purulent matter alone was expectorated, mixed with a small quantity of mucus. With the occurrence of the pus night fever set in. He died more from exhaustion, the result of exposure and intemperate habits before his illness, than from the extent of the disease. The hospital wards were at this time very close and confined at night. The opening of the doors and windows to get rid of the offensive smell produced by the over-crowding, and the

frequent washing the floors, seemed to hasten the fatal result in this case, as in nearly all the other consumptive cases. The wards at this time were without fireplaces or any other means of raising the temperature above what it was in the open air. This shows the importance of keeping consumptive patients in a place in which the temperature can be kept constantly at from 60 to 65 degrees Fah.

In the next case, these clots had not excited inflammation. This was due to the rapidity with which death ensued nine days from the commencement of the congestion. The patient, a male, aged 36, a labourer on the wharf, stout and well nourished, suffering three months from symptoms of disease of the heart, entered the hospital, February 5th. He had, he said, got cold three days before admission. He had cough, with great difficulty of breathing, and expectoration of thin mucus tinged with blood and mixed with small clots of blood; pulse, 120, feeble, cheeks and lips bluish. He had drank heavily and been much exposed to cold and wet before the heart was first affected. There was dulness on percussion in the lower half of the left lung, without either vocal resonance or crepitation. There was considerable crepitation in the lower three-fourths of the right lung. The heart's dulness was increased in extent, its action laboured with alteration more marked in the mitral than in the aortic valves. The liver dulness extended from above the nipple to two fingers' breadth below the false ribs; urine scanty, containing a small quantity of albumen. The feet and hands were swollen. He sank on the 12th.

The left lung contained a large number of clots varying in size from a pea to a large filbert. Some parts of the lung were congested but not markedly so in the immediate vicinity of the clots, except at a large one near the root of the lung. The left lung also contained several small clots; this lung was generally gorged with serum and softened. The liver and kidneys were large and softened. The spleen was pulpy. The heart was enlarged and the mitral and aortic valves thickened.

The next case presents points of considerable interest.

Pulmonary Apoplexy, followed by inflammation of the right lung and abscesses—Effusion into the pleural cavity.

Male, aged 25, a labourer, four years in the colony, entered the Hospital, May 3. His health was good until the 3rd of February, when he was seized with spitting of blood, dark coloured fluid, and clotted. Since this he has had two other attacks, the last one three weeks ago. He could assign no reason for the attacks. He has lost considerably in weight. In the right lung, *in front* at its apex, there was dulness on percussion, but very little increased vocal resonance. Behind there was a coarse gurgling sound extending along a large bronchial tube to the lower lobe of the lung. Here there was moist crepitation, with dulness on percussion extending over the whole of the lower lobe, both in front and behind. The expectoration was copious, thin and frothy, mixed with small pellets of phlegm. No blood and no traces

of pus. Pulse 96. Skin cool in the day, but at night there was a distinct access of fever, but without marked perspiration. Urine loaded with lithiate of ammonia.

8th.—Complained of severe pain in the region of the right nipple. This was relieved by a blister. The crepitation had gradually extended over the whole of the right lung. The night fever was more marked. In the lower lobe the crepitation was coarser. This gradually extended up and affected the whole of the lung.

By the 25th the pulse had gradually risen to 120; it was feeble. He had still the accesses of fever at night, ending in cold sweats towards morning. The left lung had become implicated. In its apex, and to near the nipple, there was crepitation; in the rest of the lung the respiration was peurile. The right lung was pressed up by air and fluid in the right pleural cavity. Hands and feet swollen; the former were livid. The expectoration had become very scanty since the effusion appeared in the pleural cavity. Respiration, 30; pulse, 120, feeble. The breathing got more and more difficult. The emaciation increased. Hands and feet more swollen. He died on the 2nd of June.

The upper lobe of the right lung contained four or five abscesses, varying in size from a filbert to a large walnut. The lung was deeply congested around them. An irregular canal passed from one of the lower divisions of the right bronchial tube to the lower lobe, and opened into the pleural cavity. The lower lobe of

the lung was indurated, and the walls of the chest were covered with false membranes. A pint of sero-purulent fluid existed in the pleural cavity. The left pleural cavity contained several ounces of serum, and the perieardium from four to six ounces. The left lung was gorged with serum. There were no traces of any tubercular deposits in any of the organs. He was working at Queens-cliff when seized, and had been very much exposed to cold and wet. He had drank heavily.

The following cases will show how pulmonary apoplexy generally ends by forming cavities in the lung:—

Congestion of the Lung of some weeks' duration—Apoplexy of the Lung, followed by cavity.

A male, aged 31, eight years in the colony. He has, with the exception of an attack of colonial fever, and one of dysentery soon after landing, enjoyed good health. He has never been addicted to drinking. There was no consumption in his family. From working in a wet place he was seized with cough and slight pain in the upper part of the left lung, with expectoration of "yellow phlegm." He has lost flesh.

January 27th he presented the following state:—Fine and coarse crepitation in the apex of the left lung, extending from one and a half finger's breadth above the nipple upwards; dulness on percussion, and vocal resonance slightly increased; expectoration consisting of yellow mucus streaked with blood (this for the last week), and amounting to two

tablespoonsful in the course of the twenty-four hours ; pulse 114, feeble ; emaciation not very marked, but increasing ; slight fever towards morning ; urine high coloured, and containing a " little pink sediment." Strict rest was enjoined, a blister ordered to be applied, and the acetate of lead and opium internally. 29th.—On the 28th he was better, and spat no blood, and very little phlegm. On the morning of the 29th he went to work ; being late, he walked fast ; this brought on severe pain in the chest, and spitting of blood in considerable quantity. He returned home, and went to bed, but he still continued to bring up blood. In the evening he presented the following state : Face pale ; pulse, feeble, 120 ; the blood fluid, and in dark clots, the quantity expectorated since the morning amounting to a pint. There was marked dulness on percussion in the space above the left nipple, and complete absence of respiratory and voice sound. Around the outer side of the space, near the shoulder there were mucous râles, and on coughing there was a feeble gurgle heard in the centre of the dulness. Ice was applied to the chest, and the acetate of lead and opium continued. Strict rest in a sitting posture enjoined, as it was the one in which no blood was brought up. If he laid down, cough was excited, and fluid blood was expectorated.

February 1st.—He has brought up no fluid blood, and only a few clots. Pulse 120, feeble. Cold beef-tea ordered.

The clots of blood continued for a few days longer ; then they became mixed with mucus, tinged with blood and some fine shreds of lung tissue, and later with purulent

matter. The gurgling sound heard in the centre of the dulness on the 29th of January increased in loudness and extent; but it was not until the middle of February that the indications of cavity became fully marked; then the voice sound became tracheal, and there was gurgling heard both during inspiration and coughing, followed by metallic tinkling. The lung had evidently become indurated around the cavity. The phlegm at this time was of a yeasty colour, and contained air bells; later it became yellow and mucous, without air bells, small in quantity, scarcely amounting to a tablespoonful in the twenty-four hours. With the later state the cavity contracted in size, and the space above the elaviele sank, and formed a deep impression, contrasting markedly with the space on the right side.

The treatment in this case consisted in the exhibition of salad oil, nitrate of lead with opium, and the introduction of a few threads of white wool to act as a counter-irritant. Strict rest, with avoidance of exposure to the night air, was enjoined. He gradually recovered.

Bronchial irritation—later Pulmonary Congestion and Pulmonary Apoplexy—followed by breaking up of the Lung, and formation of cavity.

A female, aged 18, a servant, two years in the colony. Her health, with the exception of frequent attacks of colds and coughs in the cold weather, from living in a damp house, has always been good.

She has lost flesh lately, and her menstrual discharge has got pale and scanty. Her family are healthy, and free from consumption. Three weeks ago she was taken with spitting of blood. The quantity was not large, and it was dark colored. It was checked by some medicine which she received from a chemist. It has returned several times since, but on the day before seen, the 27th of December, the quantity was considerable, from half to three-fourths of a teacupful.

There was dulness on percussion in the apex of the right lung, from two fingers' breadth above the nipple to the clavicle, but there was very little increased voice resonance.

There was some tubular breathing, accompanied with harshness, and a feeble mucous râle. She had a short hacking cough, and expectorated clots of dark blood, clots of mucus tinged with florid blood, and a little purulent matter. Her pulse was 116, feeble—face pallid—and towards night she had a slight access of fever, and her urine contained lithiate of ammonia.

The return of the hæmorrhage was checked by the acetate of lead and opium, and strict rest, but the lung broke up and cavity formed.

On the 10th of March she presented the following state:—Emaciation not increased—pulse 120, feeble—no night fever—urine natural—breath short on exertion—cough severe and troublesome on exertion and early in the morning. The expectoration consists of mucus, which clings

to the bottom of the vessel—clots of mucus and of some yeasty-looking muco-purulent matter, and amounts to three-fourths of a teacupful in the course of the twenty-four hours. In the apex of the right lung there was still dulness on percussion, but the voice sound was markedly increased and tracheal; on coughing, in the front of the chest, there was a puffing sound heard.

Above the spine of the scapula, both during coughing and during inspiration, metallic tinkling was heard. This case presented a peculiarity which I have several times noticed here—viz., that if examined at night, from the cavity being distended with the secretion from its lining membrane, the symptoms characteristic of its existence may be more obscured, and lead the practitioner to doubt the existence of cavity, or to consider it to be very small.

In these cases the expectoration is generally more copious the first thing in the morning than at any other time.

I have seen several other cases following nearly the same course, and others in which acute congestion has set in in a lung previously weakened. Apoplexy has ensued in the weakened lung, while the other parts have become indurated. In a case of this nature from exposure, the patient had cough and difficulty of breathing, with expectoration first of mucus, and then of muco-purulent matter. Seven days later he had hæmoptysis, and brought up a large quantity of blood, and during the next seven days he brought up blood several times, and the expectoration was tinged with blood.

On the 15th day there was irregular dulness on percussion above the right nipple, without increased voice resonance, showing the existence of blood. Below the nipple, both anteriorly and posteriorly, there was the fine crepitation of congestion.

On the 22nd day there were all the indications of induration—viz., dulness on percussion, and increased voice resonance, both above and below the nipple.

Above the nipple there was a little coarse crepitation, which by the 24th day had become gurgling, indicating the formation of cavity. In another case the progress was similar.

Both died; the first in four, the second in six months.

For apoplexy occurring in connection with congestion, induration, and softening, see *Inflammation*,—Chapter V.

CHAPTER V.

Influence of inflammation of the lungs in producing Consumption.

INFLAMMATION of the lung, either occurring alone or in connection with pulmonary apoplexy, is the most frequent cause of consumption in the colony. The expectoration of black blood indicating pulmonary apoplexy, may precede or accompany the congestion—the first stage of inflammation—or only occur on the lung softening and breaking up. From the cavities being fully formed when the cases seek medical assistance, it is not possible to trace their exact progress, particularly when the spitting of blood, at whatever period it may have occurred, has been slight. The congestion, when it ends in cavity, generally passes through two other stages of inflammation, namely, *induration* and *softening*. If the congestion is acute and extensive, the patient's health much reduced, either by previous disease or intemperance, the *indurative stage* may be so slightly marked and of such short duration as to escape attention, or the two may become so blended together that they cannot be separated. Pulmonary apoplexy, congestion, induration, and softening may also be so mixed together, particularly when the upper lobes of the lungs are affected, that it is nearly impossible to discriminate where one begins and the other ends.

The upper lobe either of the right or left lung is nearly invariably the seat of these changes, the middle and lower lobes of the right lung and the lower lobe of the left one being but seldom affected. The lower lobes of both lungs are, however, particularly liable to become congested in colonial fever, and to be attended with more or less implication of the pleura. The congestion in fever will disappear if it is passive or depending on the position of the patient, as the fever disappears; but if it is inflammatory, induration may ensue, but it rarely passes beyond this stage unless previous disease or tubercles exist. It may be said that as a rule when a cavity in the lung is met with, it is in one or other of the upper lobes. At one time I was inclined to think that the right upper lobe was more liable to break up than the left one, but for some time both seem to have been nearly equally affected, the liability being however a little greater in the right than the left lobe. In 190 cases in which the seat of the cavity was noted among the out patients, in 89 it was seated on the right upper lobe; in 76, in the left upper lobe; and in 25, in both upper lobes. When cavities occurred in both lobes, the right one seemed to have been generally affected first, and for some time before the left one. The implication of the left lung, either with congestion more or less general, or with cavity, is of constant occurrence. If the emaciation is extreme and increasing, these implications are very unfavourable. I have seen the cavity in the right lung lessen in size and nearly heal, when one has formed in the left

lobe, and attain a large size in a very short time. This tendency of one lung to be followed by implication of the other, although the cavity is small, is a peculiar feature of the disease here. Not one of the 25 cases in which there was a cavity in both lungs, recovered or lived more than from eight to fourteen weeks. The duration of life was, it must be however, said, greatly influenced by the care taken of the patients.

This form of consumption may be said to be here, what the tubercular is in the old country. It presents three stages more or less distinctly marked, namely, *congestion*, *induration*, and *softening* or *breaking up*. The three stages may be so intermixed with each other that neither their progress nor where one commences and the other terminates, can be distinctly traced. This is particularly the case when the bronchial tubes are inflamed and gorged with mucus or blood; or the lung breaks up so rapidly that there is no time for the indurative stage to form. The cases in which this is liable to take place are those who have had previous attacks of congestion of the lung, or whose constitutions have been injured by drinking heavily, bad food, scurvy, and exposure to cold and wet.

The characters of the *congestive stage* are—that with fever, which may be more or less intense, or with cold chills and sweats, tongue white or brown, pallid face or flushed cheeks, and pulse varying from 100 to 120 or even 140, offensive urine or fæces—pain in one or other of the upper lobes of the lungs, aggravated on breathing, cough varying

in intensity the nearer the alteration is seated to and irritating the bronchial tubes; expectoration, first of clear mucus, then tinged with the colouring matter of the blood, and the fine crepitation or wheeze characteristic of congestion.

If the patient is confined to bed in a dry warm room, blistered, salines with acids given, the attack is generally easily checked. Beef tea and wine or brandy must be given freely to keep up the strength. If, however, the patient is allowed to go about, or to be exposed to cold, and badly fed, the congestion will increase and the difficulty of breathing, which was perhaps at first slight, increase in severity.

The congestion may never pass into induration, but into a cavity from a clot of blood being effused into the congested lung. In some cases the effusion of the clot can be distinctly traced. A little more pain than in the rest of the congested part will be complained of, generally from one to three inches below the clavicle, but of such small extent that its existence may escape even the notice of the patient. In this spot, by the aid of the stethoscope, the crepitation will be less marked unless the air passes through the clot, then it will be more or less coarse, according to its size. The crepitation around the clot will become insensibly coarser, and form a distinct ring. With these changes, a dark clot of blood is usually expectorated, and with it more or less fluid blood. It is in this way that a cavity forms in congestion of the lung. I have already described

the manner in which congestion occurs around the clot in pulmonary apoplexy. (*See pulmonary apoplexy.*) The result is the same in both instances—a cavity which extends at the expense of the diseased lung. The upper lobes of the lungs are the most liable to congestion, and consequently to cavity. The lower lobes are not exempt from congestion, but it is less active and less liable to end in the same manner. This form is met with in children suffering from softening of the stomach, and in colonial fever. In the latter disease, it occasionally passes into the indurative stage; but usually, as the fever decreases, it disappears, but it often leaves, if there has been any pleuritic pain, adhesions between the lung and the walls of the chest. Exposure to cold and wet, or sleeping in a damp cold room, may cause the rest of the lungs to become congested. In the early days of the colony, the occurrence of general congestion of the lungs either with or without dysentery, was the cause of the frequent fatality of colonial fever.

Induration.—This, the second stage of inflammation of the lung, may occur under two circumstances: the congestion may either pass into it, and the cavity form in the induration, breaking it down by ulceration; or the cavity forms first, the lung indurating around it, a circle of well marked crepitation existing outside, the three extending together. In chronic bronchitis of long standing, the lung in the immediate vicinity of the diseased bronchial tubes sometimes become indurated; and when the latter

ulcerates, the cavity extends at the expense of the induration.

When congestion passes into induration, three circumstances may occur—first, it may remain and even pass into fatty tissue under the influence of long rest, and the tendency which inflammatory deposit has to pass into fatty tissue. I have several times seen this happen in cases of long standing. In one case the patient, a female, 43 years of age, stout and well nourished, entered the hospital, suffering from extreme debility, but without cough or expectoration. The heart's sounds were extremely feeble, pulse the same. There was considerable dulness on percussion in the upper part of both lungs, but there was no increased vocal resonance, or respiratory murmur, and no pain. Her aspect generally was like tallow. She stated that six months before admission she had had inflammation of the lungs. The cough, expectoration, and pain had gradually disappeared. Her menstrual discharge ceased. She had never left her bed from the time she was taken ill until brought into the hospital. Death ensued at the end of three months, without any marked alteration in the state of the lungs, from debility.

There was a thick layer of fat under the skin and about the organs of the abdomen. The liver and kidneys were fatty. The walls of the heart were fatty throughout, but the organ was rather smaller than usual. The whole of the upper lobe of the right lung was converted into a yellow fatty mass. The upper part of the lobe of the left one was

similarly affected, but not to the same extent. The air tubes in both had disappeared. The fatty deposit was distinctly defined.

In the *second*, the induration gradually disappears, and the lung recovers its healthy state.

The following cases are good illustrations of the manner in which this takes place:—

1. A man aged 30 had been very much reduced by long continued dysentery, attended with considerable loss of blood. Three days before his admission into the hospital he was taken with difficulty of breathing—slight cough with a little mucous expectoration, untinged with blood. There was fine crepitation, confined to the lower two-thirds of the right lung—pulse 140, very feeble—skin harsh and hot—tongue clean and moist. The crepitation gradually disappeared, and was replaced by dulness on percussion, increased vocal resonance, and tubular respiration. Insensibly the respiratory sound began to return at the upper border of the dulness, increasing gradually in extent, and with it the dulness on percussion, and the increased vocal resonance disappeared. Throughout there was not more than two teaspoonfuls of mucous expectoration in the twenty-four hours, and it was never tinged with blood. The return of the lung to its normal state was unattended by any return of the crepitation.

In the second case, the patient was a female, nineteen years of age. She was pallid and her flesh flabby—her menstrual discharge was natural but very scanty—the whole of her

right lung was affected, but she had neither cough nor expectoration—difficulty of breathing being the only symptom referable to the chest; her pulse was 110, without much power—skin harsh and rather hot, but the tongue was clean and moist. In this case, as in the other, the lung cleared itself from above downwards, and with it there was no return of the crepitation.

In the third case, the patient, a male, aged twenty-six, was also of a pallid complexion, with flabby muscles; the congestion was excited by bathing in a water-hole, when in a state of perspiration. There was great difficulty of breathing, cough, mucous expectoration tinged with blood; and crepitation at first in the upper half of the right lung, but it extended on the second day of the attack to the lower half. The induration first manifested itself in the upper half of the lung, and then in the lower half, and was complete on the eighth day of the attack; the expectoration then became rusty coloured. Under the employment of iodide of potassium, and the cautious administration of small doses of mercury, the induration rapidly subsided, and by the twentieth day it had disappeared. Previous to the establishment of the induration, solution of acetate of ammonia had been given. As the induration disappeared, the expectoration became less rusty in colour, and at length thin and mucous. Throughout the case the quantity of phlegm expectorated was never very great; in the stage of congestion it amounted to two tablespoonfuls in the twenty-four hours; in the stage of induration to only one, and as it disappeared, it again

increased ; and from its accumulating in the bronchial tubes, fine mucous râles existed.

When *congestion* of the lung occurs alone, and the expectoration is of a rusty tinge, there is no difficulty in recognising its existence, but when the mucus accumulates in the bronchial tubes, the crepitation is as coarse as in bronchitis. It is therefore not always possible to distinguish between congestion of the lungs and bronchitis, unless the case has been watched from the commencement.

There is a form of congestion of the ultimate air cells met with here, unattended with congestion of the substance of the lungs. It usually ends in asthma of the most severe form, from the patient being unable to expectorate the small quantity of mucus which accumulates in the air cells.* (*See Asthma.*)

* Acute congestion of the ultimate air cells is, like bronchitis, becoming common in the colony. It differs from congestion of the lungs in several very important points. There is no expectoration, or if there is, it is scanty, and consists of a little mucus brought up with difficulty and with relief to the breathing, as if getting rid of it enabled the blood in the pulmonary artery to circulate more freely. The patient breathes like a person suffering from asthma, and makes the same efforts to fill the chest with air. The chest on percussion is not so dull as in congestion of the lungs, but there is more dulness about the base of the heart, from the pulmonary artery and right auricle being gorged, and there may be some indistinct churning sound in the right side of the heart heard as if the right ventricle was tended with blood and unable to force it through the tricuspid and pulmonary valves. When disease of these valves exists, the alteration is then more marked. The external jugular will be prominent, and pulsate more or less from the reflux of blood in consequence of the auricle being unable to empty itself into the ventricle. The walls of the cells rubbing against each other present a mucous wheezing sound which, when the membrane is very dry, may assume almost a leathery sound. As mucus is secreted

The fine crepitation heard in pleuritis is also very apt to be confounded with congestion of the lung. It is not uncommon to find this kind of crepitation to occur in connection with congestion and induration. In congestion, effusion will gradually occur to a greater or lesser extent, and produce the peculiar nasal alteration in the voice sound, and as it increases in quantity, there will be dulness on percussion and absence of the voice sound, except along the upper border of the effusion.

In induration, this crepitation occurs under different circumstances. It is more frequently found in the right than in the left side, commencing about two fingers' breadth above the nipple and extending downwards over a space varying in extent from the size of the palm of the hand to the whole band. The sound will be found to be caused by bands of fine cellular tissue of from one to two inches in length, rolling against each other in breathing. The sound will disappear if the patient is placed on the opposite side. It is rarely attended with pain, cough, or expectoration, unless the surface of the lung is affected. Fluid is sometimes effused into the meshes of these cellular bands, or the lung may ulcerate below them, and one or more, superficial

and finds its way into the bronchial tubes, the wheeze will become moist and more or less coarse. An attack of acute congestion of the air cells rarely ends in congestion of the substance of the lung, followed by its attendant changes of induration and softening. There is another marked peculiarity not seen in congestion of the lungs, namely, that it is very liable to return again and again, and to be accompanied with more or less bronchitis,

cavities form, which may open into the bronchial tubes or even externally. I have seen in these cases of adhesions, attacks of acute pleuritis, implicating the rest of the pleural membrane, occur on exposure to cold and wet.

From the occurrence of congestion and pulmonary apoplexy with induration, pleuritic adhesions, and then softening, are of frequent occurrence, although but few opportunities occur of watching their progress throughout. The following is one of the best illustrations of this form I have been able to collect.

The patient was a strongly built male, aged 26, but looked older, a labourer, five years in the colony. He was taken—fourteen days before admission into the hospital, from exposure to cold while covered with perspiration—with cough and expectoration, first of whitish and then of yellowish phlegm, about two table-spoonsful in the course of the twenty-four hours, and slight difficult of breathing. He continued his work up to the seventh day, when he spat up large quantities of blood for fifty hours, then it ceased, and he again spat up phlegm, but it was generally tinged with blood. Blood has been brought up several times since, and on the day before he entered he brought up a large quantity.

The day after his admission there was irregular dulness on percussion above the nipple on the right side, with fine and coarse crepitation, but no increased vocal resonance; fine crepitation below the nipple, and posteriorly there was also crepitation, but it was somewhat coarse: pulse, 110

inspirations, 36; expectoration mixed, consisting of clear mucus, mucus tinged with blood, and clots of dark blood.

5th day.—He still continues to bring up blood, at times in considerable quantities; before it is rejected his face flushes considerably. His father, he states, died of fever, and his mother of old age; none of his relations had died of consumption. His health has always been good, with the exception of a cold, which he caught six months ago from living in a tent. He has drank hard at times.

7th day.—He still brings up blood at times, in large quantities, and before it is rejected his face still flushes. To-day there is in the right lung anteriorly above the nipple increased vocal resonance, with dulness on percussion, and the latter is more marked and more diffused than it was. The fine crepitation has disappeared, but the coarse crepitation remains; below the nipple, and in the axilla, there is still fine crepitation; but, posteriorly below the spine of the scapula, there is dulness on percussion, increased vocal resonance and tubular breathing; but at and above it there is coarse and fine crepitation, with increased vocal resonance.

In the left lung the respiratory sound is rather tubular; but with the exception of slight ægophony below the spine of the scapula, there is no alteration. The expectoration contains, in addition to the clear mucus, mucus tinged with blood, clots of blood, a little rusty-coloured mucus.

9th day.—There is but little alteration in the general

symptoms ; his face is pallid, breath slightly fœtid, exhalation from the skin the same, pulse 98, feeble, inspiration 36 ; there is some purulent matter in the expectoration. Above the right nipple the mucus râles have become coarse ; and below and above the clavicle slight gurgling can be heard when he coughs. Below the nipple and axilla, tubular breathing has replaced the crepitation, with increased vocal resonance, and in front with slight jarring sound, from cellular bands passing from the surface of the indurated lung to the walls of the chest ; posteriorly below the spine of the scapula, there is slight gurgling on coughing, following the course of one of the larger bronchial tubes.

12th day.—Cheeks flushed, last night sweated considerably, he had sweated before, but not much ; pulse 97, rather feeble ; expectoration getting markedly purulent and increasing in quantity. There is loud gurgling heard both below and above the clavicle, and coarse crepitation, both anteriorly and posteriorly in the upper half of the lung surrounding the cavity. When the expectoration became copious, the fœtid breath and exhalation from the skin disappeared.

He died one month after this, in a state of extreme emaciation. There were large cavities in the upper half of the right lung ; the lower half was indurated and slate-coloured, and the bronchial tubes dilated. This lung was generally adherent, superiorly and posteriorly directly, but anteriorly and inferiorly by long cellular bands. The left lung adhered in parts : it was generally grey, and denser than usual.

Third stage—that of Cavity.—It is in this stage of the disease that most of the cases come under observation. The stages of congestion and induration often pass unnoticed unless the patient is struck down by a severe attack of colonial fever, or unless a large portion of one lung or both is affected. Nearly always—and I speak of the labouring classes, women getting up too soon after their confinement to look after their families, domestics and labourers getting cold after cold, which their situations compel them to neglect—the cavity in the lung is fully formed when they seek advice. Occasionally the lung is on the point of breaking up when seen, but more frequently it has done so. It is in this stage that the disease may be said to resemble consumption as met with in the old country. There is the emaciation sensibly and often rapidly increasing—the pallid skin, the quick feeble pulse, the purulent expectoration, night fever, preceded by chills more or less marked, and sweats, high coloured urine loaded more or less with pink deposit; attacks of purging, though not so common, but becoming more so than formerly—and fistula, although only at present occasionally observed.

In the old country, patients usually die worn out with the disease, but here this is not always the case; patients will live on until there does not seem to be scarcely enough lung tissue left to breathe, or the lung loses its power of ejecting the matters secreted, and the bronchial tubes become distended with them, or the opposite lung becomes congested, the pleura inflamed, as indicated by the pain in that side;

or when the emaciation is extreme, the blood becomes so thin, that clots either form in the heart, or it loses its power of stimulating the organ; or death ensues either from repeated small bleedings from the vessels of the lungs; for when the patient is very reduced either by repeated bleeding or by the emaciation attending the disease, a very slight loss will cause the disease to end fatally, or from a sudden gush though not very large in quantity. Patients will at the onset of the disease lose a large quantity of blood and yet recover so as to be able to get about. But if the cavity in the lung continues to extend, and the emaciation increases, then the loss of a very small quantity may either prove suddenly fatal or hasten death. Here as in the old country, the patient hopes on, while the disease is daily sapping the vital powers. Pregnancy will often arrest the progress of the more chronic forms. The same tendency to become pregnant does not seem to exist here as in the old country. This seems to be due to the menstrual discharge generally ceasing as soon as the emaciation becomes marked. Its cessation is always an unfavourable indication, whether it precedes or follows the formation of the cavity.

Manner in which a Cavity forms.—This may take place in two ways, rapidly or slowly. If a lung is already weakened by previous disease, debauchery, or from the occurrence of an acute attack of congestion, particularly of the upper lobes of the lung, and in connection with a severe attack of colonial fever; the cavity may form within ten or fourteen days, or it may take several weeks. Under which-

ever circumstance it occurs, the progress, unless pulmonary apoplexy preceeds or co-exists with it, is the same. The fine crepitation or wheeze heard under the clavicle becomes insensibly at one spot a little coarser until it becomes gurgling and the expectoration distinctly purulent, of the size of a sixpenny or a shilling-piece, and flat from the absence of air-bubbles. This form of expectoration is characteristic of cavity. In some cases it is intermixed with clear mucus, mucus tinged with blood, or clots of black blood; and if one of the larger vessels is opened, by fluid blood. With the gurgling or the coarse sound, the fine wheezing or crepitation will cease in its immediate vicinity, if the lung indurates, but it is heard around it. The occurrence of coarse crepitation in the midst of fine crepitation, is a certain indication that a cavity will form; and this alteration with induration of the lung around it, and fine crepitation outside of it again, are equally indicative that a cavity has formed, and that it is extending. A cavity when once formed may remain stationary, if the lung is not extensively affected, or if the fever is not severe. In some cases the congestion of the lower part of the lung and the fever seem to subside. The cavity remains stationary or lessens in size; it may even heal, but few patients will consent to the strict confinement to bed necessary to effect a cure. They do not feel ill enough to do this. The result is that from exposure to cold or damp, the pain in the upper part of the lung is aggravated—cough is excited, and the phlegm increases in quantity. With these the cavity will increase in size, and the induration and congestion

become more marked. With the extension of the cavity and the other changes in the lung, constitutional symptoms appear. There is a distinct access of fever in the evening, followed by sweating in the morning—the pulse rises in frequency up as high as 108 or even 120, it is feeble—the emaciation and pallor increase, the cough is more or less troublesome, according as to whether the larger divisions of the bronchial tubes are irritated, and thick clots of purulent phlegm are expectorated mixed with mucus from the bronchial tubes. This is the history of nearly all the cases of consumption which seek medical aid at the hospital. When once the cavity is fully formed, if the patients are compelled to work for their living, the progress is nearly always unsatisfactory. A series of complications set in—implication of the trachea and larynx, from exposure to cold and wet; the purulent matter and the cough helping to irritate their lining membrane, are the most frequent. Chronic bronchitis and pulmonary emphysema are frequent complications, and they may occur alone or in connection with implication of the larynx and trachea. They all tend very much to obscure the diagnosis. The loss of voice when the larynx is affected, will prevent the voice-sound being heard. The presence of mucus in the dilated bronchial tubes may even lead to the supposition that a long cavity exists from the coarse rattle heard in coughing and breathing. The presence of mucus in the dilated air-cells from the dilatation occupying a space of the size of the palm of the hand, and from the coarseness of the

respiratory sounds, may also lead to the opinion that the lung is breaking up. It is only by the most careful examination into the history of the case—the nature of the expectoration—mucus more or less frothy and copious. The more chronic the disease and the more the patients have been compelled to labour and expose themselves to cold and wet, the more liable they are to bronchitis and pulmonary emphysema.

Pleuritic adhesions are constantly met with. Sometimes where the lung is in immediate contact with the walls of the chest, the surface of the lung ulcerates, and a communication forms with one or more of the bronchial tubes, and a cavity forms on the surface of the lung. In one case of this kind the matter found its way along the upper border of two of the ribs—the fourth and fifth—to their angles, and opened there. A large quantity of matter was evacuated daily for several months. He died, worn out by the discharge. There was an old cavity in the apex of the opposite lung.

Effusion into the pleural cavity may occur during the congestive stage—the indurative and also in this stage. In the first it occurs in connection with the state of general congestion of the lung and pleural membrane—in the second, adhesions have generally existed, but from cold, fresh irritation has been excited and effusion has followed; in the third, from the surface of the lung ulcerating and one of the bronchial tubes opening into the pleural cavity. An ulcer may cause fluid to be effused by the irritation which it excites in the pleural membrane, even without exposure to cold and wet,

and the escape of fluid from the opened bronchial tube may act similarly.

4. *Diarrhœa*.—This does not seem to be so common here as in Europe. Some years ago when impure water was more frequently drank than at present, both diarrhœa and dysentery were common.

5. *Fistula of the Rectum*.—This is becoming more common than formerly. In seven cases in which it existed, there were tubercular deposits in the lungs. Four of the number had come to the colony with lung disease and the fistula. In the remaining three cases, consumption was hereditary in the family—the tubercular diathesis was strongly marked. In one examined after death, a cavity with tubercles existed in both lungs.

6. *Diseases of the Liver and Stomach*.—Among those who had drank heavily of spirits, enlargement of the liver was common—death generally set in before cirrhosis and its attendant dropsy appeared. The most common disease of the stomach was chronic softening; in a very few cases it was acute. In very young children, the hot weather was very liable to excite acute softening. The incessant vomiting in adults tends very much to reduce the patient's strength. The purging and vomiting in children, when severe, reduced the strength and constantly hastened, if it was not altogether the cause of the fatal result. As before observed, there is a strong tendency in children to softening of the stomach in hot weather.

Mania.—The mind has a strong tendency to get weak in

the latter stages of cavity. There is often a mild form of delirium, not unlike that observed in the slighter forms of delirium tremens. Taking too freely of spirits, for which there is often a very great craving to deaden the severity of the cough, seems to have a great deal to do with producing it. The presenee of objects or animals in the room is common. One patient at first began to complain of a white animal moving round the skirting of the room. As the emaciation increased, he sank into a semi-idiotie state, and later, into a comatose one with dilated pupils. In this case the brain was pale and contracted. There was a considerable quantity of fluid in the arachnoid cavity. There was a large cavity in the apex of the right lung—the lung below this was indurated and pale. The left lung was indurated and contracted and adherent to the walls of the chest. The heart was very small. There was only a little pink blood in it and the large vessels. The liver and kidneys were small and pale. He had drunk very freely before his illness. Consumption often occurs during mania, but from exposure to cold and wet.

In a few of the cases, profuse menorrhagia existed—in three of the cases from cancer of the womb; the patients were from 45 to 50 years of age. In two others, there was ulceration of a corroding nature affecting the mouth and neck of the womb; in another there was a corroding ulcer in the vagina. The consumption seemed to have been excited in all these cases by exposure to cold and wet.

The menstrual discharge stops very early in the disease here—uterine and vaginal leucorrhœa sometimes co-exist.

The cessation of the menstrual discharge is an unfavourable indication. The womb and the ovaries will be found small and pale. In males, the testicles lessen in size.

Duration and Termination.—When once the cavity is formed, it is impossible to say how long the case may last before a fatal termination takes place. Recovery is always doubtful when the cavity is large, and if it is increasing in size. The duration will be greatly influenced by the care taken. The patient who is well nourished, rested, and kept in an equal temperature of from 60 to 70 degrees Fahrenheit, will live longer and have a better chance of recovery than one who drinks, is badly cared for, works, and is exposed to cold and wet.

Whenever the patient loses flesh and strength, and the pulse increases in frequency, and the opposite lung becomes affected, the case is nearly certain to prove fatal. This implication of the opposite lung may take place slowly or quickly. The following is usually the history: as the cavity extends, the lower part of the lung indurates and adheres to the walls of the chest; insensibly a cavity forms in the apex of the other lung, or the whole of that lung becomes more or less indurated and adherent. There is but little pain. The cough becomes more frequent; the phlegm, in the absence of bronchitis, may not increase very much in quantity. The patients in these cases live on until the lungs become so far altered, that it is difficult after death to understand how it is that they have lived so long. This is the progress of the chronic form of the disease. In the acute form, every

fresh cold aggravates the disease, by producing congestion of the healthy part of the lung. If one lung is considerably affected, a severe chill may produce congestion of the opposite one, and if this is general and severe, death is nearly certain to follow in a very short time. After death the tissue of the lung will generally be found softened, and gorged with serum.

From the liability to cold, through remaining in the clothes wetted by the night sweats, the disease nearly always progresses steadily towards a fatal termination. People of the middle period of life, as a rule, with care, live longer than the young, who have not attained their full growth. From six to twelve months is the average duration of the disease in the latter, while in the former, it is from twelve months to two years. I have known cases live three years. Males do not seem to resist the disease better than females, when exposed to the causes which produce or aggravate the disease. From the same cause the robust and stout do not seem to be able to resist the disease better than the delicate. The disease in the former generally assumes a more inflammatory type; the congestion is greater, and the lung often breaks up with more rapidity than in the thin and delicate.

Treatment—1. *In the congestive stage.* Strict rest in bed in a dry and warm room, and well protected from cold, is one of the most important means in relieving congestion. These alone will by encouraging the action of the skin, cure the disease in from ten to fifteen or twenty days, if had

recourse to in time. Blistering the chest, with the internal administration of iodide of potash and nitrate of potash, squills, ammonia and senega with tincture of henbane or morphia and ethereal ether. If the pulse is quick and full the breathing difficult and painful, six or eight leeches may precede the blister with advantage. Calomel and opium with tartarized antimony may be given occasionally with advantage. As a rule, however, patients do not bear calomel well, from the blood being thinner, or the fibrine softer than in Europe; it salivates quickly and often hastens rather than checks the formation of cavity. Neither opium nor morphia acts beneficially if the breathing is very difficult or the congestion general. I have known a large dose of either hasten a fatal result, particularly when the pulmonary artery was implicated. The patient must not be kept low—beef-tea should be given freely, and wine or brandy. The antiphlogistic treatment and the low diet adopted in the early days of the colony, rather hastened than checked the fatal result. Sponging the body rapidly with hot vinegar and water without exposing it to cold, will be found to help the action of the skin, which is much more active here than in Europe.

Indurative stage.—In Europe, induration generally takes from twenty-five to thirty-five days to disappear, when treated by rest and diet alone, but here it will disappear quicker. The remedial and other measures to be employed are the same as in congestion. Calomel is generally borne, and when carefully given, helps the lung to clear itself more rapidly than it otherwise would do.

In the stage of Cavity.—A small cavity may heal, but a large one rarely does, particularly if the lung surrounding it is congested. The slightest cold will excite or aggravate it; getting out of bed when warm, or lying in the clothes wetted by sweating at night. Shutting up a patient in a hot close room all night and then opening windows or doors to ventilate the place in the morning seems to have a great deal to do with causing the disease to be so rapid and fatal in our hospitals.

Strict rest in bed or in a warm dry room, the temperature of which should never be allowed to fall below 60 degrees Fah., is a most important feature in the treatment. If the patients go out it should be only in the middle of the day when the sun is warm and the air dry. Exposure to cold, wet, or the early morning and evening air, should be strictly interdicted. Whatever excites or aggravates the cough is injurious. No treatment can be of service when these rules are not attended to. It is painful to admit that remedies can do but little good when the cavity is large and the emaciation marked and increasing. Small blisters over the seat of the cavity either kept open by savine ointment or frequently repeated, answer better than croton oil liniment—gallie acid with squills, morphia, chloric ether; minute doses of chloride of zinc with the Calabar bean, often act well for a time. The dilute sulphuric acid controls the night sweats as well here as in Europe. The cough at night and the difficulty of breathing are greatly relieved by smoking about five grains of belladonna leaves in a long pipe, drawing the fumes well

into the chest to bring them in contact with the bronchial tubes and air-cells. When the patient cannot smoke, burning the leaves in a saucer, the head being covered with a small sheet, so that the air, impregnated with the fumes, is inhaled, may be had recourse to. Smoking a small quantity of the prepared opium used by the Chinese, is often of service, if checking the expectoration does not aggravate the difficulty of breathing. Cod liver oil, salad oil, chopped beef, beef suet, *finely* powdered spermaceti in doses of two or three grains three times a day, cream, or rich milk are all of service. Oils and fats are not so well borne here as in Europe. They excite biliousness quicker, and prevent the patient taking other nourishment. It is a question whether this does not counterbalance the benefit which they produce. Dr. Blair has brought under my notice an emulsion formed of cod liver oil and iodide of iron which answers extremely well for children and adults who cannot take cod liver oil.

CHAPTER VI.

Influence of acute and chronic gangrene in producing consumption. Cases.

WHENEVER obstruction of the pulmonary artery takes place, gangrene of that part of the lung to which it is distributed is certain to follow. The size of the vessel obstructed will influence the extent of the alteration. It does not, however, follow that the obstruction occurs in the larger divisions, but in the smaller ones, extending backwards. It is in this way that cavity often forms in the surface of the lung, as the result of inflammation extending from the pleura. It is nearly impossible to trace all the circumstances which occur in connection with the formation of a cavity in the lung, from gangrene of a small portion of it, from the patients rarely seeking medical assistance until compelled to do so from being unable to work.

There is a peculiar feature sometimes met with, that there is no expectoration and but very little cough although the cavity steadily increases in size and the patient emaciates and becomes more and more cadaverous looking. These cases are rarely observed, but now and then they will come under the practitioner's notice, and more frequently in private than in public practice. When the gangrene is of small extent, the matter formed may be expectorated alone

or with blood more or less foetid and disagreeable to the taste, or it may be absorbed, or form cysts containing foetid fluid. The gangrenous cavity, when once formed, may extend without, as I have just observed, there being any expectoration or cough; the extreme and increasing emaciation, with the foetid breath, being the only symptoms, with other signs of cavity, namely, cavernous respiration and increased vocal resonance. The dulness on percussion, and the fine and coarse crepitation present in cavity, the result of inflammation, being absent. The separation of the gangrenous portion of the lung may, and no doubt often is, followed by inflammation of the walls of the cavity, which then extends in the same manner, and with the same physical signs as cavity resulting from inflammation in the first instance. In the case of the son of a medical man, aged 17 years, tall and thin, the first symptoms were those of fever of a low type, with a tendency to faint. There was neither cough nor expectoration, but the breath was foetid. In the apex of the right lung there was a very slight mucous râle, and some dulness on percussion, but no increased vocal resonance. These symptoms lasted for ten or twelve days, then there was a little expectoration of offensive fluid. About the 21st day a very little thick purulent matter was expectorated, and with it the walls of the cavity became congested; fine crepitation then appeared, and somewhat later it got coarse. From this time the cavity extended, and the cough, which was before slight, increased in severity. Subsequently he had repeated attacks

of bleeding from the lungs, the first one from over exertion. A large cavity gradually formed in the upper lobe of the right lung, with more or less induration and adhesion of the lower lobes. The left lung became implicated and adherent to the walls of the chest. With these alterations there was night fever, with increasing emaciation, and occasional attacks of diarrhoea. Death ensued at the end of eighteen months. The expectoration throughout never exceeded a large tablespoonful in quantity in the 24 hours; it was always yellow and heavy, and without air cells.

In the following case there were several soft irregular masses, varying in size from a small walnut to an orange, in the right lung. It is not without interest, as it tends to show how cavities form in obstruction of the pulmonary artery:—

A labourer of florid complexion, aged 30, applied at the institution on March 8th, suffering from slight spitting of blood, attended with pain to the left of the sternum, near the base of the heart. There was some slight tumultuous action heard in the course of the pulmonary artery; the heart's action was increased, but there was no alteration in the valves. There was fine and coarse crepitation at the base of the lungs posteriorly. The breathing was very difficult, more so than the lung symptoms accounted for; the slightest movement aggravated the difficulty of breathing and excited violent palpitation of the heart. The cough was very slight, and the expectoration scanty, consisting of a little pink coloured mucus; pulse was 120, feeble; urine

and bowels natural; tongue rather clean; skin cool. He was ordered to confine himself to bed, and apply a blister to the chest, and to take some gallic acid, with chloric ether.

March 15.—I was requested to visit him. There had been but little alteration in the symptoms until last night, when he spat up a large quantity of bloody offensive fluid, very disagreeable to the taste. Pulse 120; mucous râles existed in the right lung; the cough was very slight, it was unattended by pain; the breathing was still difficult. There was still slight pain in the region of the pulmonary artery, and the sounds heard at its origin were very confused.

18th.—He had continued to bring up the offensive fluid. The left lung was becoming congested. In the evening the whole of this lung had become affected. In the vicinity of the root of the lungs, both anteriorly and posteriorly, there were coarse râles; the breathing was very difficult; nose and lips were cold, and dark coloured; breath cold; mind tranquil; a little expectoration of offensive, thin, dirty mucus. He died in the course of the night.

The right pulmonary artery contained long fibrinous clots which extended into the ramifications of the vessel. The right ventricle contained a round fibrinous mass of the size of a small walnut. The lining membrane of the right side of the heart, and the pulmonary artery were injected. There were several soft, irregular masses, varying in size from a walnut to a small orange, in the right lung. The larger divisions of the left pulmonary artery were free, but the smaller ones were obstructed over a larger space, in the

upper and central part of the superior lobe ; the lung tissue was soft, and infiltrated with dirty offensive fluid.

In cases of acute congestion which so often occur in the previously or apparently healthy lung here, and destroy the patient in the course of 24 or 48 hours—these soft irregular masses are often found with the serous infiltration and softening of the lung—there is evidently a gangrenous tendency. If the patient lives long enough it may pass into gangrene. I have met with one case of this kind, but the notes and the *post mortem* appearances have been mislaid.

In the following cases the gangrene was acute :—

A man, about 40, was brought into the Hospital in a dying state. He had been found in a kind of hut made with bushes on the bank of the river. From what could be learned, he had been suffering from cough and low fever. He had evidently drank hard. In the upper and lower lobes of the left lung there was an irregular cavity, which was divided into three divisions, partially separated from each other by bands of softened lung tissue. The cavity would contain about half a pint of fluid. In one of the divisions of the upper one there was a well-marked lining membrane, and the lung around it was indurated, but easily broken up into a kind of pulpy mass. In the second division there was a quantity of offensive pulpy fluid, consisting of broken-up lung tissue and blood altered in character. In the third division the alteration was not so strongly marked, and two or three vessels could be traced through it, pale and empty. These vessels, followed up,

were found to be branches of the pulmonary artery, closed by fibrinous clots which adhered closely to the walls of the vessels. The walls of the second and third divisions were formed of the substance of the lung, a well-defined line marking the separation of the healthy from the diseased lung.

A female, aged 27, the mother of five children, confined two weeks before. When seen, January 6th, she had been ill for one week. From getting up on the seventh day, a very hot one followed by cold wind and rain, she had got cold, and fever had set in. The place she lived in consisted of a hut without a fireplace. The symptoms were those of colonial fever of a low type; the pulse was 120 and feeble; tongue brown, with delirium of a tranquil character at night. There was no cough, but a short hacking sensation in the throat, which caused her to bring up a little thin watery fluid. Her breathing was more difficult and hurried than the symptoms accounted for. The respiratory sounds were absent in the upper part of both lungs, but there was no increased vocal resonance or marked dulness on percussion. On the 9th, the tongue was brown and dry; pulse 125, feeble; there was still no cough, but the breath was offensive and the expectoration was dark-coloured and offensive. There were distinct râles in the upper part of the lungs. The case from this time, until death, which took place on the 16th, presented no very marked alterations in the symptoms, beyond that the indications of breaking up of the lungs became daily more evident, and the fluid

expectorated and breath more offensive. Diarrhoea set in on the 11th. In the apex of the right lung there was a cavity of the size of an egg, which was half full of dirty offensive brown fluid; the walls of the cavity were soft and discoloured, and formed by the lung. The discolouration extended from half to three-fourths of an inch into the substance of the lung. In the upper lobe of the left lung there was a similar alteration, but it was not so extensive. The lining membrane of the pulmonary artery and its branches throughout, as far as they could be traced, were injected, and the vessels near the alterations in the lungs closed by clots, consisting of fibrine and the colouring matter of blood.

In the following cases gangrenous cavities were found in the lungs, but the disease was not so acute.

The first patient, a male, aged 33, admitted on the 21st of March. He is of moderate stature, without much muscular development, a storekeeper by occupation—he states that he has drank about ten glasses of spirits daily, but he has been known to drink twenty. With the exception of a slight attack of fever twelve months ago from getting wet, he has, during the seven years he has been in the colony, always enjoyed good health. Ten days before admission he got wet, and remained in his wet clothes—rigors, followed by fever, with pain in the chest and cough set in. When admitted his breath had a gangrenous smell and he expectorated foetid matter. He was ordered ammonia in decoction of senega, beef tea and wine. On

the 28th he presented the following state: breath not quite so offensive as it had been—not perceived when he is breathing quietly, but if he coughs it is very disagreeable, pervading the whole ward; pulse 120, feeble. On the 23rd it was 108—inspirations irregular, ranging from 42 to 48 in the minute; fine loud crepitation heard at the upper part of the posterior part of the right lung, with slight dulness on percussion; lower down, near the angle of the scapula, for a space of the size of the palm of the hand, a clear sound on percussion; here and below tubular breathing and slight gurgling sound in coughing; when lying quietly on his back he does not cough, but if he changes to either side or sits up, then it is excited, and continues until after a little glairy yellowish matter, without air bubbles, is expectorated—it is not offensive, and he brings up more in the morning than at any other time; liver dulness extends from one finger's breadth below the nipple to the edge of the false ribs; bowels regular; sleep disturbed; urine high coloured and scanty. He improved slightly up to the 1st of April; then from exposure to draught, he complained of pain in the left side below the nipple, and his pulse quickened. On the 3rd his pulse was 114, weak, inspirations 42, feeble and diaphragmatic; tongue moist, yellow in centre, but red at its sides and point; expectoration a little increased; a little friction sound was heard over the seat of pain, extending up to within two fingers' breadth of the nipple; dulness existed posteriorly on this side, as high as the angle of the scapula, with crepitant

mucous râle ; on the posterior part of right side the fine crepitation had been replaced by coarse mucous râles. When he sat up cough was still excited, and he spat up, after it had lasted rather less than a minute, from one to two table spoonfuls of matter like that previously noticed ; his aspect was somewhat obtuse ; blister to side—one grain of opium every four hours.

4th—Pulse 138 ; had had a little sleep, blister had removed the pain—the crepitation at the base of the posterior part of the left lung getting coarser, and there is fine crepitation in the right side below the axilla, near the nipple ; 8 ounces of wine ordered.

6th—Feels better ; pulse 120 ; the respiratory sound is returning in the left lung anteriorly, but in the right one and in the posterior and inferior part of the left, consolidation is gradually setting in. On the 11th a little delirium was observed at night, he made several attempts to get out of bed, and thought he was in another room, and not in the ward.

16th—Cough is rather troublesome ; gurgling sound heard in the posterior and inferior part of the left lung—in the posterior part of the right one there is extensive cavernous respiration, and slight gurgling sound on coughing ; anteriorly, and in the superior third of the right lung, there is mucous crepitation deeply seated, and not always heard.

23rd—He still thinks he is in some other place, and after the examination, asked if he were really in the Melbourne Hospital. He has gained a little strength—

spits but very little—pulse 108, rather feeble—breath offensive, it has rather a fecal than a gangrenous smell, and this has existed some days; there is a little more dulness anteriorly on the upper fourth of right lung than in the left—the breathing in it is tubular, approaching to cavernous, below it is tubular, and in the whole of this side the vocal resonance is increased, with a kind of buzzing jar; below the nipple there is a very feeble friction sound—on the left side anteriorly there is a deep-seated coarse crepitating râle; posteriorly in the right side there is generally cavernous respiration, with a gurgling sound on coughing—dulness on percussion, and increased vocal resonance; in the left side there is tubular respiration, approaching to cavernous below the angle of the scapula; but there is much less dulness on percussion than on the opposite side.

He continued to improve from the 23rd of April up to the 21st of May. On the 16th his tongue was clean and natural; bowels regular; skin cool, pulse 96, but feeble; it varied, some days it was 120; his appetite was pretty good; urine natural; cough slight, and expectoration very scanty; he could lie on either side; breath scarcely offensive when he was breathing tranquilly, but if he coughed then the fecal odour became evident. The physical signs were the same as those noted on the 22nd of April, with the exception that the friction sound below the nipple on the left side had disappeared, and that on the right side was not so fine, but the peculiar buzzing jar existed on speaking with the same degree of intensity.

22nd—During the visit he coughed up, suddenly, about half a tea cup full of thin disagreeable tasted brownish fluid with little white masses floating in it, and a small piece of lung of the size of a small bean; it had an intensely foetid fecal odour; his pulse was 150, very feeble; his skin moist, and tongue clean; his breathing was not particularly affected; he was free from pain; chest not examined. He twice brought up the same quantity of matter before his death, which took place in the night.

The body was not emaciated. The foetor when the chest was opened was extreme. The right lung anteriorly adhered to the costal pleura, by bands of cellular tissue; they were rather long anteriorly, but they soon got shorter, and the lung adhered directly and so intimately that it was necessary to use the scalpel; in separating it posteriorly an abscess was broken into, containing about a pint of the same kind of fluid as that which had been brought up. The posterior wall of this abscess was formed by the ribs, it was oblong in shape, from two to three inches broad, and occupied nearly the whole of the posterior aspect of the lung; it was somewhat irregular in shape, and its walls were formed of healthy lung, without any adventitious membrane. A bronchial tube, capable of admitting the extremity of the little finger, opened into it. The upper and lower parts of the lung were extremely dense and slate coloured; inferiorly it adhered intimately to the diaphragm. The left lung did not adhere, but the pleura was grey and thickened; tubercles were scattered throughout its substance; in some

parts it was indurated, particularly in its lower and upper parts; in others it was infiltrated with frothy serum. The bronchial tubes in both lungs were unusually large, particularly in the left one, easily admitting the fore-finger. The spleen was dense and liver like. The kidneys were large, the right one more than the left, their cortical substance very coarse. The liver was not very large, but it was pale, yellow, and nutmeggy.

In the second case, the patient, aged 39, a carpenter, evidently of delicate constitution. He had been nine years in the colony, and states that he had always lived temperately. He entered the hospital on the 30th of April. Two months before his admission he took cold, and two days afterwards he was seized with severe pains in the left side; it got better, but three weeks ago, from drinking water when in a state of perspiration, the pain returned, and continued very severe, and he has not since been able to lie on the right side. For the last eight days he has had pain in the abdomen, and purging of the bowels, with straining at stool; urine natural; appetite bad; breath offensive; air enters the lungs freely, but there is a slight friction sound in the left side. Blister applied to side, He was able after the application of the blister to lie on the right side, and the pain in the left one was relieved. Various remedies were given to check the purging, but all failed, except acetate of lead and opium.

On May 15th, he presented the following state:—Face pallid, and a little pinched, pupils contracted; he lies in a

half dozing state as if under the influence of opium, but he is not taking any ; pulse 96, very feeble ; urine natural ; motions the same ; tongue with a very thin brown fur. In the apex of the right lung anteriorly there is a little tubular breathing, but below this the breathing is rather puerile. In the left lung there is dulness on percussion in two places near the nipple ; it is more marked below than above the nipple, and there is absence of respiratory murmur here. On a line with the axilla there is a moist crepitating sound ; heart's sound not heard ; above the nipple there is increased vocal resonance, approaching to bronchophony, but his voice is very feeble and hoarse, so that he cannot give it the pitch necessary to produce the tone to determine this accurately. He was in such a feeble state, and evidently sinking, that no satisfactory examination could be made of the posterior part of his chest. Inspirations 36 in the minute ; skin cold ; breath offensive, but it is rather the offensiveness of a person with very dirty decayed teeth, and not nearly so intense as in the other patient ; liver dulness commences two fingers' breadth below the nipple, and extends to the edge of the false ribs. He has spat up in the course of the last twenty-four hours about two table-spoonfuls of thick yellowish-brown slightly offensive pus, with but few air bubbles in it.

18th.—Pulse 120, very feeble ; tongue clean and moist ; three motions in the twenty-four hours. Is taking decoction of bacl with opium and lime water. He has taken six ounces of wine daily since the 13th. He presents the same appearance as at first ; has spat up three table-spoonfuls of greenish

phlegm in the last twenty-four hours ; it smells decidedly gangrenous, much more so than that expectorated on the 16th.

20th.—Pulse 132, very feeble ; inspirations 42 ; tongue clean ; bowels once in the twenty-four hours ; breath more offensive ; phlegm whiter and not nearly so offensive, and very scanty ; nose pinched ; to-day he lies on his right side ; below the angle of the scapula there is moist crepitation, above this coarse mucous râles, but his voice is too feeble to give any vocal indications ; heart throbbing ; it is heard posteriorly, but there is no alteration in its sounds. He complains of this throbbing, and says that it interferes with his swallowing.

22nd.—Pulse 150, very feeble ; tongue moist and clean at edges, posteriorly it has a thin brown coat ; breath more offensive ; the right eye looks dull—he says that the sight of this eye has failed the last few days ; phlegm the same ; inspirations very feeble. No breath sound can be discovered below the angle of the scapula, but the heart can be heard as if beating against a thin bag, the systole being followed by a loud metallic tinkle like that produced by dropping a pin into a tumbler—it is loud enough to be heard at the next bed. It has been heard since yesterday by the patients in the adjacent beds ; it prevented the patient in the next bed sleeping all night ; the patient himself can hear it ; he still says it prevents his drinking. There is no dulness on percussion below the nipple ; at and above it there is tubular breathing ; phlegm the same.

23rd.—Pulse 132, very feeble; tongue clean; difficulty in drinking the same; the metallic tinkling is not so diffused as yesterday—then it was heard all over the left side of the chest; but to-day, if he lies with his chest forward, at an angle of 45 deg., it is heard only in a line with the axilla; but if he lies straight, it is only heard posteriorly on a line with the angle of the scapula; above the angle of the scapula the breathing resembles the noise made when a person inspires through a large wooden tube—and the same sound is produced when he coughs; but there is no gurgling; his features are very much pinched; he died two hours after the visit. On raising the sternum and the ribs of the left side, for some distance beyond the cartilages, adhesions were found at three points between the lung, just above the nipple; and the pleura covering the ribs; these points were the walls of sinuses formed in the lung, and were just capable of admitting the extremity of the little finger, and communicating with a large abscess in the lungs. Immediately below the nipple a cavity was exposed, containing pus, and communicating with another collection in the side and posterior part of the chest; altogether about three-fourths of a pint of sero-purulent matter existed. The cavity below the nipple rested immediately on the pericardium; it contained dense false membranes; the other cavity was also lined by false membrane, but they were softer than those in the former, and false membranes existed at the apex of the lung. The cavity in the lung was empty, it was of the size of a small orange; above, towards the apex, there was another

small cavity, capable of containing a walnut; from this one an irregular canal, of the size of the little finger, passed to the large one; several other small cavities existed; the two larger cavities and the canal were empty. The lung was generally indurated, and indurated lung formed the walls of the cavities and the canal; the apex was unusually dense; this was evidently of old standing. There was some tubercular deposit in the apex of the right lung, but the lung was otherwise healthy; the pericardium was quite healthy; the heart the same, but it was very firmly contracted; the liver healthy; spleen and kidneys small, but healthy. The lung disease and the effusion near the pericardium were evidently of old standing; the effusion on the posterior part of the chest, recent; for the false membrane which lined the wall of the latter was much easier broken down than that which existed in the former, and under the microscope it did not present the same fibre-like tendency. On the 20th, as will be seen from the report, "there was moist crepitation below the angle of the scapula; above it, coarse mucous r  le; and his heart was throbbing, and interfered with his drinking." On the next day the throbbing and metallic tinkling were heard; it was very intense on the second day; but on the third it could only be heard in certain positions, as if the cavity was re-filling. It is therefore probable that the moist crepitation heard on the 20th was pleuritic, and that the effusion was beginning to take place from the other abscess, and that it was completed on the 21st and 22nd. The pulse on the 22nd showed that the system had experienced a severe

shock, for it was 150, whereas on the 20th it was 132, having gradually increased, being 120 on the 18th, and 96 on the 15th. There was another peculiar symptom, viz., the peculiar noise which was heard during respiration on the day of his death, and which was evidently caused by the air passing through the canal, then emptied, which existed between the two cavities. The presence of fluid in these cavities and in the canal never induced any other sign than very coarse mucous râles.

A case will be found in the chapter on pulmonary apoplexy, page 69, in which gangrenous symptoms existed. Two cavities were found after death communicating with each other by a dilated bronchial tube. In this case the foetid breath and foetid exhalation from the skin disappeared as the expectoration increased in quantity and became purulent.

It does not seem to follow that gangrene should necessarily prove fatal. An elderly emaciated female from Ballarat consulted me for what appeared to be consumption. She had cough, with a little expectoration of purulent matter; quick, feeble pulse; slight night fever, and occasional attacks of diarrhoea. Two years before she said she had had an attack of inflammation of the lungs, followed by the expectoration of very offensive matter, which continued for several months. The respiratory sounds were natural, but more peurile than would be expected to be met with in a female at her time of life; the chest when percussed was unusually clear. She

died rather suddenly while suffering from an attack of diarrhoea. The whole of the right lung, with the exception of a thin layer on the upper third of the chest, had disappeared. This layer, consisting of a kind of granular grey mass covered with a membrane, did not exceed in its thickest part one-fourth of an inch, and adhered so closely to the ribs that it could not be separated. The pleural membrane covering the ribs below this was clear, shining, and a bluish colour, and lubricated with a little secretion. The left lung completely filled both sides of the chest; it was more elastic than usual, and quite healthy. The heart and aorta were in their natural positions. There were no traces of pulmonary vessels or bronchial tubes on the right side.

CHAPTER VII.

Influence of Chronic Induration and Tubercles.

1. *Chronic Induration.*—Induration belongs more especially to the chapter on Inflammation, but cases frequently come under notice here which present all the appearances of tubercular deposits in both lungs, and yet after death no traces of tubercles can be discovered. The lungs are grey-colored and indurated, and so closely adherent to the ribs that they cannot be separated. The cases have generally been of long standing, usually years. It is very difficult to trace the disease from the commencement, but it is progressive. In the hot weather, and on exertion, they are liable to attacks of spitting of blood, and in the winter to attacks of cold, which increase the state of the diseased lung; the breathing gets more and more difficult on exertion. They have cough, which may be either dry or attended with expectoration of mucus or of muco-purulent fluid, if inflammation of the bronchial tubes exists. The face is pallid, skin cold, pulse quick and feeble, heart sounds feeble, and the breathing difficult on exertion. The chest is flat, the head sunk between the shoulders, emaciation marked, although not increasing in a very rapid manner. They die at length worn out by the attacks of spitting of blood, from the effects of which they never seem to be able to recover fully their

flesh and strength. The patients in whom it is met with are generally men who are not compelled to work hard, such as shopkeepers and those who do not follow very laborious occupations, but yet are exposed more or less to the weather or cold.

Partial chronic induration has not the tendency to break up, like recent induration; but the lung in its immediate vicinity may do so, the induration becoming involved by the extension of the cavity. I have repeatedly found the lung in the vicinity of the induration friable or softened and infiltrated with serum, when patients have been struck down suddenly by an attack of acute congestion, the indurated portion of the lung being but little altered.

2. *Tubercles*.—In 1861, 1862 and 1863, in the *Medical Record of Australia*, I drew the attention of the profession in a series of articles “On Consumption in Australia,” to the inflammatory nature of consumption here, and to the rarity of the tubercular variety. In the cases then examined after death, the tubercles had existed before the patients left Europe. In Europe the presence of tubercles in the lungs, or some other organ, is so constantly met with, that their absence is generally noted; but in this colony the reverse is the case. In the course of fourteen years’ active practice in the colony, and with ample opportunities of making *post mortem* examinations, I have not met with many cases in which tubercles existed in the lungs (unless in connection with disease of them), or in the other organs. When met with, the patients have been exposed to the same causes which produce them in Europe,

namely—cold and damp, insufficient clothing, bad food, and a more or less tuberculous tendency in one or both parents.

I have been repeatedly struck with the tendency which tubercular deposits have to disappear in this climate, if the patients are not compelled to labour and expose themselves to cold and wet. Families in Europe in whom the tuberculous diathesis is strongly marked would have a very great chance of rearing their children with care in it, and even of wearing out the tendency in one or two generations; but to send patients out to this colony, even in the early stages of consumption, if they are compelled to labour for their living, is a very grave mistake, as the sudden alterations of temperature from extreme heat to cold, and their carelessness in not wearing flannel to protect them, is nearly certain to produce colonial fever, and with it congestion of the lungs. It is not that the tubercular deposit has the same tendency here as in Europe to break up, but the reverse; the healthy lung itself either intermixed with the tubercular deposit or surrounding it being affected. It is in these cases that I have seen the tubercular deposit detached from the softened lung.

Increase of the tendency to Tubercular Deposits in the Lungs.—In the Hospital in 1861-2, tubercular deposits were seldom met with except in the patients who had suffered from some disease of the lungs in England. They were generally new arrivals, or had not been long in the colony when they came under treatment. One case had been here five years, but his habits and occupation as a printer were unfavorable to

his recovery. In most of the cases in which tubercular deposit was found, there was consumption in their families. I use the term tubercular deposit to denote those cases in which there was dulness on percussion in the lung (it generally existed in the apex of one or other of the lungs), with increased vocal resonance, and more or less tubular breathing—the tubercular diathesis, and a consumptive tendency in the family.

When a cavity has formed, it is nearly impossible to say, in a large number of cases, whether it is the result of tubercles or inflammation. The existence of dry cough and mucous expectoration, with dulness on percussion, increased vocal resonance, and tubular breathing, particularly if of some duration before the occurrence of blood in the expectoration, or in considerable quantities from the rupture of one of the larger blood vessels, were the only means of arriving at any conclusion that the disease was tuberculous. In this it presented a distinctly different phase to that observed in inflammation of the lung or pulmonary apoplexy, followed by cavities. It differs also from gangrene, ending in the same manner, and hydatids of the lungs, a disease but rarely met with in England.

In 1861, I noted as far as possible the previous history of 205 cases, and that of their relatives, with reference to the presence or absence of any tubercular tendency. It existed either in themselves or in their families in only 72 of the number; in the remaining 165 cases, no scrofulous tendency could be distinctly traced. Exposure to cold after cold colonial fever, and diseases of the heart, were the most

frequent causes of consumption in the cases then met with. Very few were natives of this or the other colonies. The same exciting causes acted in those predisposed to consumption, as in those who were not so, namely exposure to cold and wet, working in damp ground as miners, sleeping in tents or on the ground in damp clothes, chills from leaving off flannel on very hot days and not putting them on before the cold wind set in; passing from hot rooms into the cold night air was then as now a frequent cause of consumption among youths. Families living in damp cold houses or situations may lose several of its members from the disease particularly if they are naturally delicate. I have known two, three, four, and even five die from this cause. In some of these cases I found tubercles on the lungs: in others not.*

In tracing the family history of the 72 cases, then observed:—

In 12, the fathers had died, or suffered from disease of the lungs, generally consumption.

„ 13, the mother.

„ 5, both father and mother.

„ 18, brothers or sisters.

„ 9, fathers and brothers, or sisters.

„ 9, mothers and brothers, or sisters.

„ 6, fathers and mothers, and brothers or sisters.

* When I first came to the colony, I looked upon the disease as arising from the softening of the tubercular deposit the same as in Europe. It was only on watching the cases in the Hospital that I was led to form a different opinion, that the disease was oftener inflammatory than tubercular. (See *Medical Record of Australia*, 1861–2–3.)

The patients who had lost father and mother, or father or mother, and brother and sisters, had generally had disease of the lungs before they left England.

In 1866-7, the previous history and the nature of the disease of the chest with reference to the presence of tubercular deposit on the lungs, or if a consumptive tendency in the family existed, was carefully noted in 249 cases which applied at the Institution. In 63 there was this tendency. In 42 of the number the patients were natives of England. The remaining 21 were natives of this colony or Tasmania. The Europeans had generally brought the disease with them from England, or they had suffered from it there, and on recovery came to the colony. It was not uncommon to find that these patients had spat up after their arrival tubercular masses more or less hardened or calcareous.

Of the 21 cases of the disease occurring in natives, the eldest was 22 years of age, the youngest 5; but the majority of the number—17—were between 10 and 12 years: 9 being 10 years; 3, 11 years; and 4, 12 years.

In 1873-4, there was a marked increase in the number of the cases presenting a tubercular tendency; the patients were more advanced in years, as will be seen.

Out of 294 cases which came under notice, 168 were European born, and 126 native. The tubercular diathesis was marked in 168 of the number, 84 being Europeans and 84 natives. As in 1866-7, the majority of the Europeans had brought the disease to the colony, or had suffered from some disease of the lungs in Europe.

Of the 84 natives, 42 of the number were from 20 to 25 years of age; 24 from 15 to 20 years; and 18 from 10 to 15 years: there was no well-marked ease under 10 years. Females showed a greater liability to the disease than males, for 48 of the number were females and 36 males. The ages of the females ranged from 15 (the youngest) to 25 (the eldest). They were either machinists or servants; and the disease could be nearly always traced to over-work and exposure to cold and wet, or sleeping in damp over-crowded rooms, and to some extent to bad or improper food and defective drainage.

Progress of cases of Tubercular Consumption.—It is very difficult to trace the progress of a case of tubercular consumption in the colony, unless there is a distinct deposit in the apex of the lung, and it breaks up in the same manner as in Europe, by softening of the deposit, followed by the formation of cavity. I have repeatedly seen cases of induration of the apex of the lung present—first, congestion, then induration, which has broken up and cavity formed, no trace of tubercles being found after death either in the lungs or any other organ. My experience of the examination of a large number of cases, both before and after death, is, that it is difficult to determine, particularly in recent cases, whether tubercles exist or not; but in cases of long standing in which the tubercular diathesis exist, they may be expected to be found. The tendency of the lung to break up in this country, both among natives and Europeans, is less likely to occur in the

tubercular deposit than in the lung tissue intermixed with or adjacent to it, or even in the opposite and previously healthy lung, as the result of congestion and subsequent softening. The occurrence of congestion and softening in the healthy lung is of common occurrence among patients sent out to this colony with tubercular deposit.

The usual history of these cases is this :—On landing they expose themselves to the cold night air insufficiently clad, or to wet and remain in their wet clothes ; fever is excited, and with it the lungs become congested and break up, the tubercular deposit remaining unaltered, if not previously softened.

A male, aged 22, entered the Hospital with acute congestion of both lungs, and died on the 14th day. There was a large mass of tubercular deposit in the apex of the right lung. The whole of the lung below it was indurated and congested. The right lung was gorged with serum and softened. He had drank heavily for some days after landing, and had slept on the ground exposed to the night air.

In another case, in which the symptoms had been benefited by the voyage, but had returned from exposure to cold and wet, a cavity was found in the middle lobe of the right lung, immediately below the tubercular deposit which formed the upper wall of the cavity ; it had undergone no alteration.

A man, 40 years of age, a cutter-out at a tailor's, two years in the colony ; sent out by a medical man in London

for lung disease. His symptoms were rather those of bronchitis than of consumption. The cough was long and hard, and the expectoration consisted of thick stringy mucus, occasionally tinged and mixed with blood. His aspect was tubercular, and several of his family had died of consumption. During the first and second winters he had suffered from an aggravation of his symptoms. When seen three months before death, the most marked symptoms were pain near the lower angle of the scapula, cough, and expectoration of thick mucus tinged with blood, with dulness on percussion and increased vocal resonance extending above the spire of the scapula. He recovered so far as to be able to walk slowly down to his work. Suddenly, without any previous hæmorrhage, while walking a little quicker than usual, he brought up a large quantity of blood and expired. There was a large indurated and tuberculous mass in the posterior part of the left lung. Immediately below this the lung was softened and broken up over a space somewhat larger than a large orange and intermixed with clots of blood. The tubercular deposit was separated as distinctly as if it had been dissected out. There were some old diffused tubercular deposits in a semi-calcareous state in the other lung. Had this patient been able to take care of himself, and avoid exposure to cold and wet and the night air, he would no doubt have lived for some years. It is being compelled to labour and expose themselves to the variations of temperature that act so injuriously on patients sent out here with tubercular deposit in the

lungs. With strict rest, avoiding exposure to cold and wet and the night air, going out only when the weather is warm or removing to a warmer climate in the winter, a very large number of them would have done well. The mistake generally committed is in not sending the cases out on the first occurrence of the deposit. I have repeatedly seen, when this has been done with due care on the part of the patient, the tubercular deposit removed. This was particularly shown in the case of a medical man who came out with recent deposit in the apex of the right lung, with cough and the occasional expectoration of mucus and mucus tinged with blood. At the end of twelve months all traces of the deposit had disappeared. He remained, however, very susceptible to cold and wet, and during the last two winters he has suffered from cough with mucous expectoration depending on bronchial irritation.

The following cases will help to illustrate the tubercular form of consumption, as it is met with here both in the European born and in the natives :—

Tubercular Deposit of some months' duration in a native of Europe—Congestion of the Lungs from exposure to cold and wet—Death—Tubercles in both Lungs, with softening, and serous and purulent infiltration of the Lungs.

A midshipman, aged 17, just arrived from Liverpool, entered the Hospital July 31st. Twelve months ago, from

sleeping in a damp hammock on the voyage home, he got bronchitis. He was laid up for three months, then recovered so as to be able to do his duty, but he suffered from cough at times, particularly when exposed to cold or wet. Six weeks ago he was exposed for some days to cold and wet, and was then obliged to confine himself to bed. There was no consumption in his family. He complains mostly of throbbing in the left side of the chest, but there was no very marked alteration either in the voice sound or on percussion. There is, however, fine crepitation diffused over both lungs, but it is more marked in front than behind. In addition there is dulness on percussion in the apex of both lungs, with increased vocal resonance. His tongue is white, skin dry, with an access of fever, not strongly marked, at night; urine a little high-colored. The breathing is rather difficult, but the cough is slight, and there is no expectoration. His appetite is good.

August 4th.—The crepitation had insensibly become coarser, but there was still no expectoration. There were coarse râles in the apex of both lungs. Pulse had risen to 126; it was feeble. The emaciation had increased. His breathing was very difficult. He died in the night of the 6th.

The emaciation was not very marked. The right lung was generally adherent to the walls of the chest, and also to the diaphragm. Tubercles existed, in a mass in the apex and diffused throughout the lung, the tissue of which was softened. Tubercles existed in the apex of the left lung and throughout the lung, with purulent infiltration around

them in the tissue of the lung. The lung was softened and infiltrated with serum. The other organs were healthy.

The following case presented some peculiarities:—The cavity was healing when he died suddenly while exerting himself. The cause of death being distension of the heart with blood and fibrinous clots. The heart, liver, and spleen were softened.

A sailor, aged 25, newly arrived, entered on the 17th of September. A few days after his admission he presented the following state:—Cavity in the upper part of the left lung immediately below the clavicle, surrounded by fine crepitation. In the rest of the lung there was increased dulness on percussion with vocal resonance. The respiratory sound in the right lung was not very free, and there was considerable vocal fremitus. The expectoration was scanty, yellow, and without air cells. Pulse 102, and full. Emaciation not marked, and there was no night fever. Urine natural. His gums were spongy, and there was some discolorations on his legs.

23rd.—The cavity had lessened in size, and the crepitation around it had disappeared. No cough, but still expectorated a little. Gums and spots on the legs the same.

Oct. 1st.—While exerting himself in the ward he was taken with faintness and vomiting, and died in a few minutes.

The right and left ventricles and auricles were found distended with fluid blood and some fibrinous clots, one of

which extended into the right and left divisions of the pulmonary artery. The heart was enlarged, but the walls were not thickened, they were very soft. The cavity in the left lung was lined with membrane. The lung below contained dense and cartilaginous bands in its substance and a few soft tubercular deposits. The right lung adhered closely to the walls of the chest; there were some soft tubercular masses diffused through it, but beyond this it was healthy. The liver and spleen were large and soft. He stated that his health had been good until four months before, when he caught cold in the English channel; three weeks before reaching Melbourne he had again got cold. He had lived chiefly on salt meat.

In the next case, the patient had been some time in the colony. The tubercles seemed to have been developed by living in an iron house. These houses were a great source of disease, from causing the moisture in the floor to ascend when the walls got hot in the daytime, and condensing it at night. They were intensely hot in the day and cold and damp at night.

Tubercular Deposit in the Lungs—Chronic Laryngitis and Congestion of the Lungs—Death—Tubercles in the Left Lung and Softening of the Lung—Abscesses in the Right Lung and Tubercles—Inflammation of the Trachea and Larynx.

A painter, aged 33, delicate looking, family consumptive, eight years in the colony, entered the Hospital June 18th.

His health had been good until a month ago: then, from exposure to cold and wet, severe pain was excited in the left side, with fever most marked at night and expectoration of clear frothy phlegm. Under treatment he got well enough to go to work at the end of a fortnight. He got fresh cold, which affected his throat and rendered it difficult to breathe. The cough increased in severity, and he brought up phlegm consisting of frothy mucus and clots of purulent matter. He was losing flesh and strength, and complained of great lassitude and night fever. There was marked dulness on percussion in the whole of the right lung and absence of respiratory sound, but from the hoarseness of the voice there was no vocal resonance to be heard. Pulse 102; feeble. Urine loaded with deposit.

July 14th.—The pulse had got gradually weaker, and increased to 130. The difficulty in swallowing had increased very much. He expectorated a large quantity of frothy phlegm mixed with clots of matter. In the apex of both lungs there were coarse râles. The fever the same. Emaciation and debility extreme. His mind was very feeble.

25th.—Breathing very difficult; voice weak; face pinched. He died the next morning.

The left lung contained masses of tubercles; the substance of the lung between them was softened, so that the masses could be easily separated. The right lung contained a large number of small abscesses, particularly the middle and lower lobes. The upper lobe contained a large number of

grey tubercles; this lobe adhered closely to the ribs. The trachea and the larger divisions of the bronchial tubes were covered with purulent fluid. The lining membrane of both was congested. The upper part of the trachea, the larynx and the under surface of the epiglottis were congested and covered with minute granules. The liver was a little enlarged. He had not drunk hard, but had lived in an old iron house, the floor of which was damp.

This is an illustration of this form of consumption with implication of the trachea. This implication, whether it occur early in the disease or during its progress, is always unfavourable from its causing the emaciation to increase rapidly from the large quantity of fluid expectorated, a large portion consisting of saliva which the patient is unable to swallow. The difficulty in swallowing renders the patient averse to take nourishment, from the pain which it excites in passing over the posterior part of the larynx and the irritated pharynx. The expectoration in its passage through the larynx causes pain, and keeps up the irritation. Hence few if any cases recover when the larynx becomes implicated, and particularly if there is great difficulty in swallowing and increasing emaciation.

It does not always happen that the lung is softened, although this is generally found when the patient is struck down suddenly from exposure to cold while suffering from consumptive symptoms—it may be hardened. This was the case in a case which died similar to the one just described, but death ensued gradually. The lungs were

hardened and white. In the centre of the lower lobe of the left side a bronchial tube had ulcerated close to one of the tubercular masses and communicated with the pleural cavity which contained about a pint of serous and mucous fluid.

CHAPTER VIII.

Influence of Bronchitis and Pulmonary Emphysema and Asthma in causing Consumption.

1. BRONCHITIS.—Acute inflammation of the minute bronchial tubes of the ultimate air cells may extend to the substance of the lung and produce congestion and induration and subsequently softening followed by cavity. Again, acute congestion of the lung will in its progress produce inflammation of the bronchial tubes, and with its occurrence the fine crepitation of the congestion will be replaced by mucous râles, which increase in coarseness as the inflammation extends to the larger bronchial tubes. It is, therefore, extremely difficult both in children and adults to determine whether the disease is not simple bronchitis, particularly when there is no expectoration—a circumstance by no means infrequent here. This was well shown in the case of a servant, 18 years of age. She had been ill when seen for several weeks; mucous râles of a coarse character existed in the whole of the left lung; but in the lower part of the posterior part of the right lung, as high as the angle of the scapula, fine crepitation existed. Seven days later, when again seen, the fine crepitation had extended as high as the spine of the scapula, and in the lower part of the lung coarse mucous râles existed. The upper part of the lung was

similarly affected at the end of the fourth day. The face had become insensibly bluish, and the pulse had increased in frequency and in feebleness, and the breathing more difficult. She was unable to lie down, her feet and ankles were swollen. The cough was not very severe, and throughout she had had no expectoration. The lungs were congested and rather soft; the lining membrane of the bronchial tubes, as far as they could be traced, were congested and covered with mucus. This is a frequent form here of bronchopneumonic congestion, and when it affects both lungs and interferes with the breathing, it generally ends fatally.

During the last three or four years, from the increase of bronchitis in the winter months, the suffocative catarrh, as observed in England, is becoming more and more frequent among old people.

When I came to the colony, in 1861, I was struck with the scanty expectoration in cases of consumption. Then it was rare to see more than from two to three or four table-spoonsful expectorated in the course of 24 hours, unless the larynx was implicated; but now, from four to eight ounces of pus, mixed with muco-purulent fluid and mucus, is commonly expectorated in the same time. The reason of this is the coexistence of chronic bronchitis with dilatation of the bronchial tubes and more or less pulmonary emphysema. When chronic laryngitis or pharyngitis exists, the admixture of the saliva may increase the quantity of fluid expectorated to twelve or even twenty ounces in the 24 hours.

It is easy to trace the occurrence of bronchitis, dilatation

of the bronchial tubes, pulmonary emphysema, and chronic laryngitis and pharyngitis in cavity or induration of the lung, to exposure to cold, living in a damp house or wet or foggy situations, and being compelled to labour; but not so easy to follow the manner in which chronic bronchitis ends, either in ulceration of the walls of the bronchial tubes or in cavity.

The usual history of the cases of bronchitis which end in consumption, is the following:—Every winter, as in England, the cough and difficulty of breathing increase in severity; the phlegm becomes thicker and more or less purulent, until from exposure to cold and wet, an aggravation of the symptoms sets in, with more or less pain in the chest. The phlegm may then become tinged with blood, or blood may be expectorated. The most marked feature, however, is the phlegm becoming mixed with clots of purulent matter, which, from the absence of air, sink to the bottom of the vessel. The patient loses flesh and strength more or less rapidly; the pulse creeps up from 70 or 80 to 120. There is more or less night fever, followed by sweating. The signs presented on examining the chest are very variable, and often so obscure as to render it impossible to arrive at a distinct conclusion, particularly in very old cases, as to the nature of the disease. From a dilated bronchial tube containing phlegm, it will present all the indications of a long cavity, and the dilated air cells, that there is either a cavity, or from the coarseness of the râles from the phlegm in them that the lung is breaking up.

The changes found after death generally consist of—1st, induration of the lung, confined to the immediate vicinity of the dilated bronchial tubes, with more or less adhesion of the lung to the walls of the chest; 2nd, with dilatation of the bronchial tubes there will be thickening, and in some cases an almost cartilaginous state of their walls, with or without irregular ulceration, extending into the indurated portion of the lung, which may form one or more cavities of various sizes and at different parts of the tube. These cavities may have formed as the result of inflammation of the lung, in the first instance—the bronchitis occurring as the result of subsequent exposure to cold and wet. Another frequent complication is dilatation of the air cells (*pulmonary emphysema*). The cells may vary in size, from a nut to a walnut, and occur either separately or in clusters, which may be as large as the palm of the hand. Several of these cells sometimes coalesce and form a cavity of the size of a small orange. It can be readily understood that when these states of the cells exist, how difficult it is in old cases of pulmonary disease to arrive at a correct diagnosis without carefully tracing the history of the case from the commencement. These changes are generally found in men and women who have been compelled to work hard. In patients who are not called upon to work, the walls of the ultimate air cells sometimes become indurated. If the lung is softened, they may be detached with the minute branches of the bronchial tubes.

2. ASTHMA (*Pulmonary Emphysema*).—Fifteen years

ago, asthma was scarcely known in the colony. A few patients were occasionally met with who had brought the disease from Europe, but they generally asserted that it was only at the end of six or seven years that it had returned. With the increasing cultivation of the land, the soil retaining the moisture more readily than it did; and from the large quantity of water used in the town and suburbs, asthma is increasing every winter in frequency. As yet, unless in those living near swamps and in damp houses, this disease seems to be confined within the space supplied with water from the Yan Yean.

The dry form of asthma is met with here when the ultimate air cells are the seat of the spasm; the humeral or moist when the smaller divisions of the bronchial tubes, and generally in connection with chronic bronchitis and dilatation of the air cells. There is a form of the disease met with here, in which the branches of the pulmonary artery become first congested and ultimately dilated, and attended with more or less dilatation of the right auricle and ventricle. I have had one opportunity of making a *post mortem* examination of a case of this kind. The ultimate air cells were thickened and cartilaginous in the lower part of the left upper lobe and in the upper part of lower lobe. By macerating in water they could be easily separated from the lung, which was drier and more friable than usual. The branches of the pulmonary artery going to this lobe and its left divisions, were unusually large. The right division of the vessel and its branches were not so

much dilated as those of the left one. The right ventricle was larger than the left one, and its walls were thickened; the tricuspid and the semilunar valves were thickened and somewhat contracted, neither closing completely. Both sides of the heart and the larger veins were distended with blood. Fibrinous clots extended from the right ventricle into the pulmonary artery. Six years before his death he had been under the care of the late Dr. Stewart. His symptoms, as far as could be gleaned, were attacks of difficulty of breathing occurring at irregular periods, irregular action of the heart, sometimes complete stoppage for half a minute; great heaviness of the head, with flushing of the face and weight about the heart, which threatened to suffocate him. In the interval of the attacks, he was quite well and able to walk, until within twelve months of his death, without difficulty. The last four months he was not able to walk without difficulty of breathing. Opiates always aggravated the difficulty of breathing. He died rather suddenly.

The next case presents points of great interest from the trunk of the pulmonary artery being found very much dilated after death:—

Supposed Asthma occurring after Fever, with Congestion of the Lungs—Symptoms of Dilatation of the pulmonary Artery—Death.

A farmer, working hard, 45 years of age, applied at the institution on the 21st November, suffering from “asthma.”

The attacks did not occur, as they generally do here, towards morning, but on exertion, and particularly after a heavy meal. The respiratory sound was rather feeble in both lungs, but it was more marked in the right than in the left lung; but there were no other signs referable to the lungs. He could not walk fast, and particularly up a hill, without being compelled to stop and take a deep breath. The heart's sounds were natural, and there was no increased impulse. The symptoms seemed to indicate that there was an aneurism of the thoracic aorta. His legs were slightly swollen, but there was no albumen in the urine. The liver was rather large. He had not drunk for the last six months. He thought that the disease was first excited by sleeping in his cart in the cold and wet in June. He had then fever, with cough, difficulty of breathing, and expectoration tinged with dark-coloured blood, and mixed with clots of blood of a dark colour. He got gradually better. But as soon as he began to get about and work, the difficulty of breathing set in. The heart's dulness at its base was increased in extent; the organ was not displaced, as it often is when the liver is enlarged.

There was a slight murmur in the mitral valve with the first sound. The aortic sounds were natural, but on tracing the aorta up along the right side of the sternum close to the upper border of the cartilage of the third rib, there was a kind of confused whiss-like sound similar to that sometimes heard when the aorta is bent on itself. The sound was not carried up along the aorta beyond an inch and a half, nor

could it be heard in the vessel below for more than an inch. It could be followed along the upper border of the right cartilage of the rib, but it was soon lost; on the left side of the sternum the sound was feeble, increasing in intensity towards the right side. On making him walk quickly up and down the room until what he called the "panting for breath" was produced, the sound was increased in loudness, the pulse rose from 86 to 120, but it was feeble. He then complained of the sense of deep constriction, which he always had, becoming painful. The veins of the neck during this state were a little enlarged; his head felt full, and his face flushed. He had a strong tendency to vomit during this state, and for some weeks, as soon as he got out of bed in the morning, he vomited whatever food he had taken the previous night, or if his stomach was empty, "slimy stuff." He could not lie on his back with his head low; if he did, the pain and constriction in the chest would set in with fulness of the head and retching. He could rest best on his left side, with his chest not very high and bent a little forward. If he eat a very hearty meal before going to bed, he could not rest, for on changing his position an attack would be excited. To get relief he was obliged to excite vomiting. The vomiting had reduced him very much in strength. His face was pale and sallow. By strict rest, beef tea injections instead of giving food by the mouth, and small doses of iron and digitalis, he so far improved in the course of five weeks as to be able to walk a short distance without difficulty. The sound to the right

of the sternum, and the sense of constriction, had very much diminished. He returned home. There he walked about, drank rather freely of spirits, not being able to eat. He was brought back again to town on the 27th of December, with all the symptoms aggravated. He was unable to retain any food on his stomach. There was a strong tendency to diarrhoea, which prevented the beef tea injections being retained. His legs were very much swollen, and his abdomen contained fluid. He sank gradually, and died at the end of ten days.

The sternum, ribs, and the half of the clavicles were removed to get as good a view as possible of the heart and large vessels. The aorta, below the arch, was larger than at the arch. The trunk of the pulmonary artery, and its right branch, were very much dilated. The former formed a kind of pouch, large enough to receive a small orange. The coats were very thin. The pulmonary valves were unusually long. The heart was flabby. The walls of the right ventricle were very thin; its cavity was unusually large, and seemed to form quite two-thirds of the organ. These were the only changes worth noting.

The following case is the only one I have met with corresponding in symptoms to the first case. The patient when 22 years of age, while in the train on a very hot day, exposed his chest to the cold south wind; this produced an attack of severe difficulty of breathing, which, from his description,

was acute congestion of the ultimate air cells. Somewhat later he had another attack, while on board of a vessel at Sandridge on a cold misty day. He then removed to Malmsbury, where during the warm months he remained well, but on the winter setting in he began to suffer again. He then returned to Melbourne. His narrative, extending over eight pages of closely-written foolscap, contains a long list of the different medicines ordered by one person and another. The attacks of difficulty of breathing were very severe, lasting sometimes for several days. The fine wheeze characteristic of congestion of the ultimate air cells, was general, affecting both lungs. The jugular veins were congested. The dulness at the base of the heart was more extended upwards than when in health, as if the vessels at the base of the heart were gorged with blood. His pulse was quick and hard. During the attacks of spasm, he stated that there was great pain in the region of the chest, aggravated on breathing. Opiates and irritant applications to the chest aggravated rather than relieved the symptoms. When sent out of Melbourne to a warm dry atmosphere, he was better. This winter (1874), from the place where he resided being wet and cold, he has suffered somewhat, but the attacks have been quickly relieved by the extract of Calabar bean, digitalis, chloral hydrate and squills.

The influence of obstruction of the pulmonary artery and its branches, whether in connection with spasm or congestion of the ultimate air cells of the lungs, or from some

reflex action acting through the medium of some of the branches of the nerves, has not been sufficiently investigated.* The latter may be occasionally met with here in children. In one case of this kind, the child, on exposure to the cold air, gets first a distinct attack of asthma, followed by spasmodic croup, which, if severe, ends in convulsions—the croup and the asthma ceasing. The influence of mental excitement is very great, both in causing and relieving an attack of asthma. I have seen some hysterical females who have had the power of bringing on an attack or aggravating it whenever they pleased, by drawing in the abdominal muscles and holding the breath for a short time. Asthma, in this country, is not confined to any particular age, but, as a rule, it rarely occurs before the 30th year. I have repeatedly seen it in infants and young children living in damp cold houses. The tendency of children to suffer if their parents have done so, is becoming common here. Patients suffering from chronic bronchitis and chronic consumption, if living in a damp or cold place and compelled to labour, are very liable to suffer.

Asthma, or pulmonary emphysema, may be either acute or chronic. The division into *dry*, *humeral* and *spasmodic*

* See Diseases of the Pulmonary Artery, in "Heart Diseases in Australia," page 93. The distension of the right auricle and ventricle and the trunk of the pulmonary artery is a peculiar feature in asthma. The benefit of medicines which act directly on the heart, such as the Calabar bean and digitalis, is due to this. Both these remedies in large doses will often cut short an attack.

seem to be rather arbitrary than practical. An attack of dry asthma is often relieved by the expectoration of more or less tenacious or fluid mucus, or the humeral by the cessation of the mucus on the patient being placed in a warm dry room, or on copious sweating occurring. The one may pass into the other; the dry form, from the occurrence of bronchitis, may become humeral, and the reverse may take place. Both forms may be more or less spasmodic, the difficulty of breathing being easily excited by mental emotion. I have not seen any cases of "hay or ipecacuanha asthma" here, but the street dust on very hot days will sometimes bring on an attack when the tendency to asthma is very great. This seems due partly to the extreme rarefaction of the air from the heat, and inspiring the dust from the streets. In one case, the patient had suffered from hay asthma in England. There, as here, dust and heat also produced the attacks.

Acute Asthma, or acute Pulmonary Emphysema, like bronchitis, is becoming more and more common in the colony. It is but seldom that the practitioner has an opportunity of watching the case beyond the first attack. Usually it is considered to be acute congestion of the lungs. The diagnosis, although not unattended with difficulty, may be known by the following indications:—

1st. In acute asthma, there is no expectoration, or if there is, it consists of a little mucus brought up with difficulty;

while in congestion of the lung, it is more or less copious and tinged with blood, and even mixed with clots of blood. The attacks of difficulty of breathing are very apt to return on exposure to cold and wet, and to be attended by bronchitis; the expectoration will then consist of thin glairy mucus intermixed with little pellets of hard mucus. The more the air cells are dilated, the larger these pellets become, and form clots not unlike those expectorated when a cavity exists.

Secondly: On percussion, the sound is not so dull as in congestion of the lungs. In old cases, when pulmonary emphysema exists, the sound is clearer. There is, however, more dulness about the base of the heart, from the right auricle and the pulmonary artery being gorged with blood. There may even be some indistinct churning sound on the right side of the heart heard, as if the right ventricle was distended with blood and unable to force it through the tricuspid and pulmonary valves. When disease of these valves exists, the alteration is then more marked. The external jugular veins will be prominent and pulsate more or less from the reflux of blood, in consequence of the right auricle being unable to empty itself into the ventricle.

Thirdly: The parts of the lungs not immediately in contact with the chest will present a mucous wheezing sound which, when the cell membrane is very dry, may assume almost a leathery sound. As mucus is secreted and finds

its way into the bronchial tubes, the wheeze will become moist and more or less coarse.

Fourthly: An attack of acute congestion of the air cells rarely ends in the congestion of the substance of the lung, followed by its attendant changes of induration and softening. The patient breathes like a person suffering from asthma, and makes the same efforts to fill the chest with air.

Chronic Asthma, or Chronic Pulmonary Ephysema.—When patients suffering from asthma come under notice, the disease is generally in the chronic stage. It is, therefore, very difficult to trace it from the commencement. In many of the cases, there was no marked acute attack, but every fresh cold had aggravated the symptoms. The following is the history of the cases when the disease is developed:—

Usually the attacks of difficulty of breathing occur between night and morning—from 12 to 5 A.M.—and after exposure to cold and wet. They cease as soon as the day gets warm, if there is no expectoration, or after lasting one, two or three hours, or on the expectoration of pellets of mucus or a large quantity of thin or frothy mucus, more or less mixed either with masses of mucus or thick mucus. The months of May, June, July and August are the months (the coldest here) in which the greatest number of patients apply; but few cases come under observation in November, December, January and February. Some patients suffer more in the very hot than in the

temperate and cold months. In these cases there is often disease of the heart.

Influence of the Seasons in causing Bronchitis and Asthma.

The climate of Melbourne varies very much; and the atmosphere, from the large quantity of water used in the town and in the suburbs for irrigating the land, has become very heavily charged with moisture. The effect of the latter is to reduce the mean temperature considerably. The last two winters (1873 and 4) the fog was as dense as in London. The ice some mornings in the month of August was thicker than a penny piece. The result of this increased quantity of moisture is to render bronchial disease and asthma more common than before the town was supplied with water. The effect of this increase in the amount of moisture is to render it a very bad residence for the consumptive. I have not seen any case do well in it for a long time. When I arrived in the colony in 1861, I was struck with the small amount of expectoration in cases of consumption. This is not the case now, from a third to half-a-pint or a pint being often expectorated in the twenty-four hours; the amount depending on the existence of bronchitis. Cases in which the lung breaks up with but slight cough and no expectoration are now comparatively rare.

The following table will show the relative frequency of bronchitis, inflammation of the lungs, and consumption, treated at the Institution for Diseases of the Chest in the

different months for two years—January to December 1867, and August, 1872, to July, 1873 :—

	Chronic Bronchitis.	Consumption.	Total.
January	24	8	32
February	44*	36	80
March	27†	35	62
April.....	8	24	32
May	13	7	20
June	27	21	48
July	20	23	43
August	12	20	32
September	2	16	18
October	16	33	49
November	35	37	72
December	28	20	48

Table showing the number of cases of acute bronchitis, congestion of the lungs, pleuritis, chronic bronchitis and asthma, and consumption, treated in 1872-3 :—

	Acute Bronchitis.	Congestion of Lungs.	Pleuritis.	Chronic Bronchitis and Asthma.	Consump- tion.	Total.
1872.						
August	16	8	3	20	44	91
September ...	28	..	...	7	9	44
October	32	16	...	21	27	96
November ...	23	29	1	41	27	121
December ...	31	41	8	4	25	109
1873.						
January	44	21	2	40	21	128
February ...	16	20	...	17	31	84
March.....	68	44	4	15	29	160
April	32	...	8	39	29	108
May.....	60	5	7	40	28	140
June	48	4	6	37	21	116
July.....	68	8	...	52	16	144

In the first table 1867, January, April, May, and September, were the months in which the fewest cases occurred.

* Nine were recent cases, ranging from two to four months.

† Eight of the cases were recent.

In 1867 there were but very few cases of asthma, but in 1872-3 there was a large number. This increase is due to the cause just named, and to cases of bronchitis extending to or commencing in the air-cells being nearly certain to produce asthma. In ehronic cases of consumption, when the patients are obliged to wash and iron, and expose themselves more or less, asthma is nearly sure to exist.

In the second table for 1872-3, September and February were the months in which the smallest number of cases of lung diseases sought relief. I have noticed that other causes than atmosferic will cause an accession of eases, namely epidemics of measles, searlet fever, colonial fever, hooping ough. Patients coming from New Zealand with lung disease, and the effect of the changeable weather on those in health eoming from the warmer climates of New South Wales, South Australia, Queensland, &c., producing lung disease, help to swell the number of the applicants.

An analysis of the cases which ocured in the different months of 1872-3 may not be without interest :—

August: Of the twenty cases of chronic bronchitis and asthma, four were recent, ranging from six to nine weeks in duration, the remaining sixteen eases had suffered every winter or on sudden ehanges of the weather. Of the 44 cases of consumption—in 21 the disease was recent, under three months in duration ; in 11, over three months and under six ; but in the remaining twelve cases it ranged from nine to twelve months.

September: The seven eases of chronic bronchitis and

asthma were all old cases. Of the four cases of consumption, two were recent, the third, six months, and the fourth, twelve months. The acute cases were more numerous than in August.

October: The 21 cases of chronic bronchitis and asthma were old cases. Sixteen of the 27 cases of consumption were recent (under three months), the remaining eleven cases being chronic.

November: Of the 41 cases of chronic bronchitis and asthma, only eight were recent, and of the 27 cases of consumption, only four, the most recent being of six months' duration. The cases of acute bronchitis were fewer than in the previous month, being 23, while the cases of acute congestion were more numerous.

December: There were only four cases of chronic bronchitis and asthma. Heart disease existed in three of the cases. Of the 25 cases of consumption, only three were recent—the remaining 22 cases had lasted, 3 for nine months, and 13 for twelve months.

January: Of the 40 cases of chronic bronchitis and asthma not one was recent. The cases of consumption were more recent than in December, 12 being of three months' duration; the remaining 9 cases ranged from six to nine months. Acute bronchitis and congestion of the lungs were frequent.

February: Nearly the same was observed as in January; both consumption and chronic bronchitis were less frequent. There were also fewer cases of acute bronchitis and acute congestion of the lungs.

March: A large number of cases applied this month. The cases of acute bronchitis and acute congestion of the lungs were numerous, amounting to 112 out of the 160 cases. Colonial fever was common, and lung symptoms predominated more than usual. The fifteen cases of chronic bronchitis were of old standing, and only five of the cases of consumption were recent.

April: In this month, the patients suffering from acute bronchitis were not very young. There were fewer cases than in March, the numbers being 32 to 68. There were no cases of congestion of the lungs. Of the 39 cases of chronic bronchitis and asthma, twelve were relapses. Only three of the cases were recent, and these were complicated with chronic colonial fever. Several of the cases of consumption had relapsed and only four of the 29 cases were recent. The largest number of the cases of bronchitis, 40 out of the 68, occurred in the latter half of the month.

May: Of the 60 cases of bronchitis, 16 were complicated with whooping cough, and 4 with croup. There were only 5 cases of congestion of the lungs. Of the 40 cases of chronic bronchitis, 8 were relapses; several were suffering from disease of the heart. There were no recent cases. Several of the cases of consumption had suffered a relapse. Only 3 of the 28 cases were recent, and 5 were over three months and under six months in duration.

June: Of the 48 cases of bronchitis, sixteen were complicated with whooping cough, five with laryngeal and croupy symptoms. Of the 37 cases of chronic bronchitis and

asthma, several were relapses. There were no recent cases. Of the 21 cases of consumption, 16 were recent.

July: Of the 16 cases of consumption, all were recent. Of the 52 cases of chronic bronchitis and asthma, 17 were relapses; the most recent case had existed six months. Of the 68 cases of bronchitis, 12 were complicated with whooping cough. The majority of the remaining patients were young—under three years of age.

The feeling of all persons who have been in Melbourne for several years is that its climate is becoming sensibly colder and moister; certainly diseases of the lungs and diseases of a scrofulous nature are becoming more common. The following table of the mean temperature of each month for twelve months of 1861 and 1870, compiled from the Registrar-General's Reports, may not be without interest:—

	1861.	1870.
	deg.	deg.
January	67·2	67·3
February	65·0	66·5
March.....	65·8	64·6
April	59·3	60·8
May	52·7	51·3
June	48·8	50·3
July	46·6	46·6
August	49·2	48·9
September.....	57·2	51·5
October	58·7	58·0
November	60·4	59·3
December	62·8	63·6

Treatment of Acute Asthma, or Congestion of the Ultimate Air Cells.

Strict confinement to bed in a warm room is one of the

best means of checking the attack. A few leeches—six, eight or twelve, according to the patient's strength—over the base of the heart, to relieve the congestion of the right auricle and pulmonary artery, followed by a large hot linseed-meal poultice, will give in recent cases marked relief. Digitalis, with chloral hydrate, bromide of potash, the extract of Calabar bean, and squills, are of great service.

Treatment of Chronic Bronchitis and Asthma.

The only effectual remedy is removal to a warm dry atmosphere. Even this, if the patient is compelled to labour and to be exposed to the night air and wet, will only keep off the disease for a time. When the town was first formed, most of the cases of bronchitis and asthma sent out here from England were very much benefited for a time. I have repeatedly heard patients say that they remained free from their old cough and asthma for six or seven years. I have so often sent patients away from the town with such marked benefit, that when their circumstances will admit of their leaving I invariably advise them to leave. In this, as in the large towns of Europe, there are numbers of people who cannot leave, either from poverty or from their occupations rendering it impossible to get a living out of it. It is these cases that the medical man is called upon to relieve—he can hardly hope to cure them, for they are nearly certain to come back to him every winter worse than they were the previous one, and they not infrequently end by becoming consumptive, or getting disease of the

heart followed by dropsy. In these cases the residence should be warm, dry and well sheltered; they should live, or at least sleep, on the first or second storey during the cold months. The room should face the sun, and at night a fire kept up to ensure a temperature of at least 60° Fah. throughout the night. Flannel should be worn next the skin night and day. Exposure to cold and wet and the night air should be strictly avoided. The diet should be light and nourishing, and although I do not see here the attacks of asthma brought on by eating heavy meals, as in England, yet eating heartily of indigestible food late at night, or just before going to bed, will render the attack severer than it otherwise would have been. Sponging the chest with salt and water, or a cold bath every morning, is of great service in rendering the patient less sensitive to the changes in the weather. It is difficult to say what remedial agents act the best. Large doses of opium or morphia will relieve some cases, but in others, from its contracting the muscular fibres of the ultimate air cells and bronchial tubes, and the heart, it will aggravate the attack. I have seen two cases in which smoking opium to excess seemed to produce asthma. The effect of a large dose of morphia or opium, from causing a kind of spasmodic contraction of the diaphragm, may cause very considerable difficulty of breathing, which may last for some time, until the effects of the dose wear off. When relief is obtained on the bringing up of clots of tough or thin mucus, then expectorants act the best. In these cases, squills or

ipecacuanha, with choral hydrate, extract of the Calabar bean in decoction of senega (double the usual strength), act well and quickly. The addition of digitalis with ammonia, when the large vessels of the heart are gorged, is often beneficial. Smoking the leaves of belladonna, or inhaling the smoke from its leaves deeply into the chest, will generally relieve the attack at once. It is necessary that the fumes should reach the ultimate air cells, from its effects being very similar to the action of the extract on the iris. I have not seen any ill effects follow its use. In hysterical females it sometimes produces headache. These were the only cases in which I saw it disagree in more than a hundred it was used in. Its benefit is less marked in patients who smoke or chew tobacco than in those who do not. All the patients who have used it, state that it is preferable to stramonium. In the height of the attack, the patients are sometimes not able to draw in the fumes deep enough into the chest to reach the ultimate air cells. It is possible that a very *minute quantity* of atrophine, dissolved in ether and cautiously inhaled, would in these cases give more immediate relief than even the smoke of the leaves of belladonna. From five to ten grains of the leaves, cut fine, should be smoked at first. A long pipe should be used, and the patient instructed to draw the smoke *well into the lungs*. It produces, when this is done, a sensation of warmth as it penetrates, followed by relaxation of the spasm and the expectoration of phlegm. It is better to use the leaves early in the attack while the power of

inhaling a deep breath exists. In chronic cases, inhaling ether, the fumes of burning sulphur, and the sulphurous acid by means of the spray distributor, are often of considerable service in some cases, while in others they aggravate the symptoms. They seem to act best in those cases in which copious expectoration relieves the attack.

CHAPTER IX.

Hydatids of the Lungs as a cause of Consumption.

IN no country, with the exception of Iceland, is hydatid disease so frequently met with as in these colonies. Prior to 1861, when Dr. Hudson, now of Ballarat,* drew attention to it, little was known concerning it. In 1861, when this gentleman published a paper on the subject, but few cases had been met with in the Hospital. Since then, it has become one of the most common diseases of the colony. It was, however, common on the sheep stations up the country amongst the blacks, partly from eating raw or underdone mutton and drinking unboiled water from water-holes frequented by sheep, dogs and other animals. Great numbers fell victims to this disease in the early days of the colony. Drinking the water of pools containing hydatids,

* It is to this gentleman the profession in the colony owes the use of a fine trocar and canula (first proposed by Dr. Rees, of London), instead of the old instrument, which was nearly always followed by inflammation, from the escape of the irritating fluid into the surrounding tissues. I had so often seen fatal effects follow the use of a large trocar, that I had abandoned it for the potassæ fusæ. It might be used here with success, in those cases in which the parent cyst contains cysts of equal size, or a number of small cysts too large to escape through a small canula. In a case of the former kind in which, although the tumor was large, but very little fluid escaped on tapping, on applying the potassæ fusæ to the opening nearly a quart vessel full of hydatids, one within the other, escaped. The patient assured me that the "outer bladder" was nine inches in length and four inches in breadth.

and eating hydatid meat, are not the only sources of the disease. The animal may be seen attached in some ponds to the plants growing in them. I have seen them on the common water cress. Eating this vegetable, when it grows in ponds or ditches frequented by sheep, pigs or dogs, is always attended with risk.

Few patients can trace the period when they first took the hydatid into their systems. In one case the patient, six months before he began to suffer from pain, followed by swelling, had drank, after walking a long distance, from a pool in which the body of a sheep which had died of hydatids was rotting. He had two companions with him, but although they drank quite as freely of the water as himself, neither suffered. In a girl, aged 12 years, 18 months before seen she had, at a school treat, drank water from a pond in a paddock where sheep were grazing. The swelling had existed six months when she came under notice. Whether it takes six months or more for the hydatid to increase to such a size as to produce troublesome symptoms, I am unable to say. The growth will depend very much on whether the patient is living in a damp situation or a dry one; cold and wet seem invariably to cause it to increase more rapidly than a dry atmosphere. Placing the patient in a warm bath will cause the hydatid to increase in size, while a hot-air bath, by causing copious perspiration, will reduce it, if the patient abstains from drinking. The lungs stand next in liability to the liver. Taking 100 cases, the relative liability would stand thus—Liver, 70; lungs 12.

Relative Liability of different parts of the Lung to Hydatids.—The upper and middle lobes are possibly more liable to hydatids than the lower lobes; but the lower lobes, particularly the right one, are very liable to become implicated when the hydatid is seated in the upper part of the liver, from the cyst penetrating the diaphragm and involving the lower lobe of the lung, from adhesions occurring between the liver diaphragm and the under surface of the lobe. The cyst in these cases not infrequently opens into a bronchial tube. The occurrence of this is preceded by more or less congestion of the lower lobe of the lung, but often of such an insidious character as to escape attention. It does not always happen that the cyst excites inflammation of the diaphragm and the under surface of the lung so as to cause adhesion between them. It may irritate the lining membrane of the pleural cavity and cause pleuritic effusion, or the cyst may protrude through the diaphragm, push up the lung, and either open between the ribs, sometimes causing absorption of them, or of their cartilages by pressure. In a case now under my care, the cyst destroyed the cartilages of the lower part of the right side of the sternum. The tumor received a distinct impulse from the heart. There was marked dulness on percussion, extending in front in a direct line to near the spine of the scapula, below the dulness blended with the liver. There was complete absence of the respiratory sound and vocal resonance, and there was no nasal voice sound along the upper border of the dulness. The intercostal

spaces were not prominent, or the ribs separated in a very marked manner. On the 19th of August, he spat up some yellow ochre-coloured matter, and the same evening he brought up suddenly three-fourths of a chamber vessel full of yellow-coloured thick mucous-looking fluid. The next day the quantity was less, and each day until the fourth day, when it ceased. When seen on the 19th, the metallic tinkling was strongly marked throughout the whole of the lower two-thirds of the right side of the chest; and when lying on the left side, each impulse of the heart caused it, but not when his body was inclined to the right. He had been a digger. He did well until the first week in September, when from cold the left lung became congested; with it the breathing got very difficult, and the appetite failed. He sank on the 14th.

In the right pleural cavity there were the remains of a large hydatid cyst, containing about a pint of matter. The walls of the cyst were dense and fibrous. The cyst seemed to have sprang from the upper surface of the liver, penetrated the diaphragm, and pushed the lung on one side against the spine. The cyst had opened into the first division of the bronchial tube behind the lung. The lung, after the escape of the matter from the cyst, had evidently descended. It was flattened and very much reduced in size.

The cyst in the upper part of the liver, when adhesions take place between the liver, diaphragm, and under surface of the lung, has a great tendency to open into a bronchial

tube. It is often difficult to arrive at a correct diagnosis of these cases.

The following cases were published in the *Medical and Surgical Review*, for 1865:—

In the body of a female, between 30 and 40 years of age, there was a large hydatid cyst, capable of holding a pint of fluid, in the surface of the liver. The liver, diaphragm and base of right lung were closely adherent; the lung was indurated, and there was an opening, passing from a bronchial tube through it to the cyst on the surface of the liver. The cyst was an old one; it contained purulent fluid.

Hydatid Cyst on the upper surface of the Liver, opening into the bronchial tubes of the right lung—Cure.

Mrs. S., aged 30, ten years in the colony. She has never eaten raw mutton or drank brackish water that she is aware of, although it is quite possible that she might have eaten badly-cooked meat. In the early part of 1863 she received a kick on the right side from a man; she was then four months advanced in pregnancy. She had severe "inflammation of the side," and was blistered and leeches without benefit. The pain continued—it was of a dull character, and at times pricking; it was worse after exertion, but two attacks of purging at intervals of two months removed the pain for several weeks. In June the writer confined her with her fifth child. She remained very well, but not quite free from the pain until October; then, from cold and over-exertion, she was seized with

symptoms of acute inflammation of the lower lobe of the right lung—she had cough, but no expectoration; pulse 96; tongue rather white. There was fine crepitation, and slightly increased vocal resonance posteriorly, but anteriorly there was an absence of respiratory sound below the nipple without vocal resonance; the liver descended below the false ribs, but above the dulness commenced close to the nipple, and was much higher than in the axilla; it was very markedly defined, and evidently consisted of something encysted. The possibility of its being an hydatid struck the writer. The attack was similar to the one she had when kicked, but the pain she said was higher, and nearer the nipple. The relief which the attacks of purging gave her before, seemed to indicate that unloading the liver by podophiline would be of service. The reverse, however, ensued; it increased the pain, and produced pain in the shoulder for the first time, excited bilious vomiting, and caused the skin and conjunctivæ to assume a jaundiced hue. Under the use of diuretics the jaundice disappeared, and the pain lessened. She was able to get about, and the writer did not see her until December. Then she was in a state of great emaciation, expectorating half a pint of watery fluid tinged with blood, and mixed with masses of mucus; her pulse was 108, very feeble. About a fortnight before this she had an attack of pain in the side and under the shoulder, with bilious vomiting and jaundice, brought on by over-exertion and getting cold. The cough became very troublesome; it was dry and hard, and prevented her

lying down. One day, the fourth or fifth of the attack, she brought up during the cough something fleshy, with a little disagreeable fluid. She did not take particular notice of this mass, but it appears to have been a hydatid. She then went to sleep, but awoke suddenly and brought up a large quantity of fluid and a number of little bladders. The fluid was intensely bitter, of the colour of bile, and very offensive. During the next five days she brought up a number of pieces of hydatids, and the fluid lost its bilious tinge and became rather watery. These pieces seemed to consist of the parent cyst; they were thick, and caused severe coughing until brought up.

The passage of fluid during coughing could be distinctly traced along the bronchial tube; but no gurgling or cavernous respiration could be heard. The dulness on percussion was less marked near the nipple, and the respiratory sound could be heard, but feebler than in health. The liver did not descend below the false ribs. Her stomach was very irritable; it rejected everything introduced into it. Under the use of small doses of acetate of lead, with morphia and beef-tea injections, the stomach recovered its healthy state, and the fluid expectorated lost its bloody tinge and diminished in quantity. About the tenth day the lead produced—although the dose given was small, and no blue line existed on the gums—saturnine delirium at night, with pain in the back, colic, and constipation of the bowels. By strict rest, strapping the right side of the chest to insure as much immobility as possible, the fluid diminished in

quantity. She took the nitrate of barytes and nitrate of iron steadily for three months.

She has lately come under the writer's notice pregnant with her sixth child. Her health has continued good, and there is now no indication of any disease having existed.

The next case presents some peculiarities, but, in its main features, closely resembles this one.

Hydatid Cyst on the upper surface of the Liver—Opening into the bronchial tubes of right lung—Relieved by treatment.

Mrs. E——, aged 43, mother of seven children—the youngest nearly two years old—fourteen years in the colony. She has always resided in the suburbs. She has eaten underdone mutton. Seen March 21st, when the following history was obtained:—Three years and a half ago she was taken with pain in the back, purging attended with severe tenesmus, the motions consisting of blood and matter. The weather was very hot at the time. This dysenteric attack was followed by severe pain in the right side in the region of the false ribs; it continued unrelieved for five months. She emaciated, and had fever with night sweats, and a short hacking cough. During a fit of coughing she brought up suddenly a large quantity of blood and matter, and at the end of a fortnight she brought up some more. She then got better. She has continued in this state, sometimes better and sometimes worse, bringing up phlegm tinged with blood, but generally matter. During

the last twelve months she has brought up constantly from half a pint to a pint in the course of the twenty-four hours. Whenever she gets cold or rides out, from the jolting of the vehicle, blood in a considerable quantity is brought up.

She has pain in the right side, in the region of the liver. It is now dull and seems to move like a ball occasionally, but at first it was pricking and at times burning; the expectoration consists of watery fluid tinged with blood and masses of mucus with blood running through them in hair-like streaks. She has two kinds of cough—one a long, hard, spasmodic one, and another short and hacking. Pressure between the intercostal spaces over the liver excites coughing. She gets attacks of night sweats about every second night. She is in a state of extreme emaciation; pulse 130, very feeble; skin and conjunctivæ have a slight yellow tinge, but she has never had an attack of jaundice; urine scanty and containing some phosphates; bowels confined, motions scanty, dark-coloured and hard. Food excites pain and distension in the lower part of the chest, which continues until coughing occurs, when it is brought up. Butter and fatty substances cause the discharge to taste hot and bitter, like bile. She often tastes the food she has taken in the discharge, and when menstruating it has a bitter taste. She can distinctly feel the discharge pass from the liver (surface of) to the lung before it comes up. There is considerable dulness on percussion on the right side posteriorly, and also on the left side, but it is not so extensive. There is no marked increased vocal resonance;

there is no respiratory sound, but on coughing fluid can be distinctly heard passing up into one of the bronchial tubes of the right side, near the angle of the scapula. The symptoms pointed to the existence of a hydatid cyst in the upper surface of the liver, communicating through the diaphragm with the bronchial tubes. On carefully questioning her, she remembered passing, five years ago, a number of little bladders from the bowels; she is not certain whether she passed any when she had the attack of dysentery, three and a half years back, but she brought up some with the blood and matter from the lungs three years ago. Her attention not having been directed to the subject, she is not aware whether she has brought up any pieces of cysts.

She was evidently sinking, from the constant loss of blood. She was ordered beef-tea injections every six hours, and only to take a little food at a time into the stomach, and gallic acid and acetate of lead three times a day, and half a grain of morphia at night. To fix the lower part of the chest, a large opium and belladonna plaster was passed nearly round it. She was strictly confined to bed. Under these measures, by the 28th the discharge had diminished to a fourth, the blood had disappeared, she had gained flesh and strength, the pulse had sunk to 84, and the spasmodic cough had disappeared. She had several slight returns of the blood, but otherwise she continued to improve. Her menstrual discharge reappeared, and became natural in colour. The nitrate of baryta was in April substituted for

the acetate of lead; it was of great service, but was not taken regularly after the first few weeks.

June 8th.—She has steadily improved; but very little phlegm is brought up, it is in little pellets, floating in a little water slightly tinged with red; pulse 80, full. She is able to get about.

Both these cases are now in good health.

The cyst rarely opens into the pleural cavity unless some injury is inflicted, and the cyst is ruptured. If the patient does not die from the shock of the injury inflicted on the liver, which is generally ruptured at the same time—death, if it does not ensue from hæmorrhage from the liver, usually takes place from severe inflammation excited by the irritating nature of the fluid from the cyst. Tapping a cyst on the surface of the liver may, from the fluid in the cyst when its walls are very dense, escape into the pleural cavity, excite severe inflammation of the pleura.

The hydatids may occur in the substance of the lung, as one large cyst, or as a number of small ones. The former, if discharged from the lung, can scarcely escape the attention of the patient, but small ones often do from ignorance as to their nature, or carelessness. When a large cyst exists, it is often difficult to diagnose its existence, unless it is near the surface of the lung; then there will be, with more or less pain, generally aggravated by damp weather, dulness on percussion with absence of the respiratory murmur and vocal resonance. When the cysts are seated deeply in the chest, near the heart or the root of the lungs, the difficulty of

distinguishing them from aneurismal or other humors is very great.

In these cases, three circumstances may occur. First, the cyst empties itself, the patient bringing up some saline and more or less offensive fluid, which may be followed by the cyst itself with more or less blood. In these cases the lung contracts, and the patient quickly recovers. Secondly: The cyst only partially separates, and from the lung not being able to contract, the vessel, if a large one, remains open, and the patient dies of hæmorrhage.

In one case of this kind the patient felt faint, and soon after brought up a large quantity of blood. He was carried home. Blood was again brought up in the course of an hour. This continued to take place for the next seven or eight days, at irregular intervals, varying from one to two or three hours, and without much cough. It was preceded by a sense of weight and fulness just above and to the left of the heart. Ice with large doses of acetate of lead and gallic acid seemed to check the quantity of blood for a short time. After death, in the centre of the right lobe of the lung there was a clot of blood of the size of a large hen's egg, and with it there was a flaccid hydatid cyst quite capable of holding from three to four ounces of fluid. The wall of the cyst was quite fibrous. It had separated for more than two-thirds of its extent from the lung, exposing a large vessel of the size of a crow-quill. In another case there was a large quantity of offensive saline fluid

expectorated, followed by a dense cyst three inches long and one and a-half inch broad. The hæmorrhage was very severe for the first seven days, then pus gradually appeared mixed with the blood, and with it fever at night. There was fine crepitation in the apex of the right lung, extending over an area scarcely as large as the palm of the hand, with gurgling sound in the centre. The cavity became more and more marked, and extended towards the right edge of the sternum. Frequent attacks of hæmorrhage occurred which reduced the patient very much, and he at length sank from exhaustion at the end of four months. There was a large cavity in the apex of the right lung. It was surrounded by condensed lung. The rest of the lung was reduced in size and slightly indurated. The left lung was enlarged and gorged with serum. These cases presented peculiarities not usually met with, from the hæmorrhage continuing after the incomplete separation of the cyst in the first case, and the occurrence of consumptive symptoms in the second. Generally the lung contracts on the expulsion of the fluid in the cyst, and although the interior of the cyst may secrete purulent matter, still if it is expelled, the lung contracts and the patient recovers.

Thirdly: The cyst may be retained, and from its walls secreting more or less purulent matter, all the symptoms of cavity will exist. The changes which occur when a number of small cysts exist, either scattered throughout the lungs or massed together, are not, as I have just observed, so easily traced. In the case of a man of the name of Ebden, a

tanner, working at Richmond, for several days, twelve, eighteen, and sometimes twenty-four were expectorated, with a large quantity of thick tenacious mucus, in the twenty-four hours. The cough was severe, of a spasmodic character. The cysts came from a spot in the region of the angles of the fifth, sixth and seventh ribs, from a dull space of the size of the palm of the hand. There was no increased vocal resonance or vocal vibration, and but slight wheezing during respiration. He had considerable pain in this region of a cutting nature. The minute cysts, transparent and of the size of peas, were discovered on examining the phlegm. The remains of cysts and hooklets were also found. It does not always happen, as in this case, that the small cysts expectorated are independent of the mother cyst. In a young female, sixteen years of age, now under my care, twelve months ago she had symptoms of congestion of the lungs. On recovery she brought up some minute cysts, and several times since. A week before she was seen several larger ones than she had ever brought up before were expectorated, one evidently being the parent cyst. A patient, 43 years of age, with a large cyst in the upper lobe of the liver, assured me that he had expectorated small bladders with the matter. The cyst, in this case, descended into the cavity of the abdomen and gave him the appearance of suffering from dropsy of the right side of the abdomen. When tapped, from eight to nine pints of fluid were withdrawn, a piece of fine catgut was introduced through the canula, and the edges of the opening were touched with

potassa fusæ to prevent the opening closing, and the cyst refilling, as had happened when tapped before. In the course of a week thick fluid of a whitish-yellow appearance escaped, in which large numbers of clear cysts of the size of large peas were floating. This discharge continued for three months, when it ceased, and the opening closed. The pressure of the cyst had evidently altered the size and shape of the liver. The patient averred that he could feel the contracted cyst when he pressed his fingers deeply under the false ribs. I could not discover that there had ever been any communication between the cyst and the lungs. Some alteration in the position of the cyst may have been the cause of this. I have generally observed that when an opening is once formed, either into the bronchial tubes, intestines, uterus, kidneys, bladder, or on the skin, it never closes while the cyst continues to secrete. The hydatid cyst, when springing from the under surface of the liver, will sometimes fill the whole of the abdomen. In a case of this kind the patient, a stonecutter, was tapped for dropsy, and two gallons of fluid drawn off. The stopping of the canula by a minute cyst, led to the nature of the disease being detected. He died at the end of several months from dysentery. The liver was not larger than the hand, and scarcely thicker. The cyst had shrunk to the size of a large pear. He was very anæmic and emaciated throughout, and although able to work a little at his business, after the cyst ceased to secrete, he never gained flesh or colour.

When a single cyst of a moderate size exists in the lung,

and has opened into a bronchial tube, its walls secreting either pus or mucus, it is very difficult to distinguish it from a cavity, the result of softening. There is the same gurgling when it contains fluid, on coughing and breathing, and the cavernous respiration when it is empty. The surrounding lung may not present the fine crepitation or wheezing, but these are also absent when a cavity is healing. The cavity of the cyst does not increase in size, and if its walls are very thick and hard, there may be metallic tinkling on coughing. The matter expectorated is sometimes of a peculiar light yellow colour. This may be considered as almost characteristic when it occurs of an hydatid cyst. The early history of the case will often help to render the diagnosis clearer. It will often be found that during exertion the cyst has ruptured, and a quantity of saline fluid has been expectorated, either with or without cough. In old cases, in which the cyst ruptures, the fluid brought up may be extremely foetid and consist either of dirty-looking mucus or semi-purulent fluid. The night fever is neither so severe as when the cavity is the result of inflammation, nor the emaciation so great, unless the cyst is very large and the secretion very copious.

It is very difficult to determine the true nature of the cavity, but the expectoration of the cyst, which generally takes place sooner or later, unless it has formed very intimate adhesions with the lung, the pleura or the pericardium. The recovery is generally rapid when once the cyst is expelled, unless the lung adjacent to it has become

diseased. This happened in a case in which, after the cyst had been expelled in pieces from the fluid secreted by the remaining portions of it, irritating the surrounding lung. The same result may happen when a clot of blood takes the place of the cyst and excites inflammation in the lung. The escape of some of the fluid from the cyst into the substance of the lung, will often excite severe inflammatory symptoms, followed by abscess and even gangrene. If, with the sudden occurrence of the pain and other symptoms of inflammation, nettle rash appears, the escape of fluid from a cyst may be strongly suspected.

Treatment of Hydatids of the Lungs.—To empty the cyst by puncturing it with a fine trocar and canula, would seem to be the most reasonable mode of procedure. In one case in which I used it, the result was not favourable enough to tempt me again to employ it. Four ounces of clear fluid was drawn off in the morning, without any inconvenience. In the evening there was severe pain all over the lower half of the left side of the chest, with friction-sound, cough, and the expectoration of a little mucus, tinged with blood. Every care had been taken to bandage the chest tight, both while removing the fluid and after its removal. He said that he had felt well for the first four hours after the tapping, then he began to feel as if a drop of hot water had ran down the side, and that other drops followed. Pus ultimately formed in the pleural cavity. This was evacuated by puncture, the opening being kept open to allow of its free escape. The opening did not close for four or five

months. The cyst was seated in the surface of the left lung, between the scapula and the angles of the ribs. He had a severe attack of nettle rash.

The hydatid is not very tenacious of life, and any injury of its walls will destroy it; the introduction of a piece of fine catgut through the canula, and moving it about or kneading the cyst on the canula, while the fluid is escaping, will often destroy it. The only objection to these plans is, that the inflammation excited will cause the fluid, if it reaccumulate, to be purulent; but it effectually destroys it.

The deposit of a thin film on the internal wall will destroy the animal's secreting power. From the large quantity of chlorides I found in the fluid in the cyst, I was tempted to try several medicines, which formed, when the system was saturated with them, insoluble chlorides, which would be precipitated on the walls of the cyst and prevent its secreting. The iodide of lead with an excess of iodine, and the nitrate of barytes with nitric acid, and nitrate of silver with nitric acid* will all act in this manner. I have generally used the iodide of lead in pills coated with silver taken when the stomach is empty, with a few drops of the *simple* tincture of iodine, in a glass of water. The patient should be debarred from salt as much as possible; be well clad in flannel, and live in a dry warm situation. Cold and moisture always increase the size of the cyst, and will often

* Most of the samples of nitric acid which I have examined here contain muriatic acid. Its presence should be guarded against, as it renders both these mixtures inert by forming insoluble chlorides.

cause it to refill. In the cases of hydatids of the lungs in which it was employed, the cyst either diminished or was expelled, and fresh cysts were prevented from reforming. It must be given for two to three months. In cysts which communicate with the bronchial tubes, or with the surface, gallic acid, with one or other of the preparations of lead, acts well and rapidly in checking the excessive secretion which occurs in these cases. The best mode of giving the lead and gallic acid, is either as gallate of lead or an excess of gallic acid dissolved in half a tumbler of water, or one-fourth of a grain of acetate of lead, with five grains of gallic acid, dissolved in a similar manner. Injecting the cyst with a little weak solution of nitrate of silver or of barytes will cause a deposit of insoluble chloride of these substances to take place on its lining membrane. The fluid of an hydatid cyst sometimes undergoes some change in which it is converted into a kind of earthy substance not unlike phosphate of lime or ammonia, or phosphate of lime and magnesia, which I am not able to say, from having lost the preparation. The cyst was as large as a marble; it consisted externally of a thin transparent membrane: internally the deposit seemed to be in layers. It was attached to the mesentery by a very thin pedicle an inch in length.

CHAPTER X.

Cancer of the Lung—Worms in the Lung—Bronchial Polypi.

1. *Cancer of the Lungs.*—Cancer of the lungs may occur here as in Europe under two forms, *primary and secondary*. In the former, it is met with both in the substance and under the pleural membrane; but in the latter, the cancer germs are generally conveyed by the pulmonary artery into its ultimate branches, where they are arrested, or from the disease extending from the liver through the diaphragm or from the ribs and pleura in cancer of the breast or the pericardium.

I have seen two cases. The patients were men, and both attributed the disease, the true nature of which was only discovered after death, to injuries of the chest. Both the patients were about 40 to 45 years of age; they had drunk heavily. In one of the cases, the patient, a builder residing in Richmond, stated that after a fall from a roof, pain in the chest set in. When seen three months after the accident, the pain was very severe at night; it lasted from two to four or five hours. There was dulness on percussion, over the sternum, below the third costal cartilage; it was much more pronounced on the left than on the right side. This dulness occupied an irregular space about seven fingers

broad and seven deep. The heart's sounds were very obscure, and they quite disappeared at the end of a month. The aortic sounds were readily heard from the upper border of the third costal cartilage, but both the aortic and mitral valvular sounds were inaudible. Altering the position of his body did not, as in pericardial effusion, render them more prominent. The pulse was natural, but feeble. His aspect presented no signs of cancer. His face was pale, but his body was well nourished. The sternum and the costal cartilages over the dull space were unusually prominent; but one part did not protrude more than another. In the course of a few weeks, the pain became still more severe. He was unable to lie down at night; the easiest position being a sitting one, with his chest bent forward, "to take off the pressure of his breastbone on a lump in his chest." He entered the Hospital, where he died worn out by the pain and loss of sleep, from being unable to lie down. I received a note stating that the heart and pericardium were cancerous. The lung in immediate contact with the pericardium was affected. In the other case, the upper surface of the liver, the diaphragm and the under surface of the right and left lungs, were affected with cancerous tubercles. The pericardium and the surface of the heart were also studded with them, but not to any very great extent. The lining of the pericardium and of the surface of the heart was congested, and the pericardium contained from eight to ten ounces of serum. The symptoms were throughout those of cancer of the liver. The patient was 45 years of age. He

had drank heavily, and been exposed to great hardships and mental trouble.

It is not always possible to trace the circumstances which influence the occurrence of secondary cancerous formations in the lungs. I have seen them implicated in encephaloid cancer of the rectum and mesentery; and in one case of the same disease on the surface of the womb, and in another of cancer of the ovary. The liver in this country, as in Europe, is much more frequently the seat of secondary cancer than the lungs, or any other organ.

Diffused cancerous masses in the lung will present many of the characters of tubercular deposit as met with here in appearance. Its true nature being only detected by scraping the cut surface and examining the fluid obtained under the microscope. This is a much better mode of examining for cancer than making a section of the growth.

Symptoms of Cancer of the Lungs.—The rarity of cancer of the lungs and from its being diffused in them, it is impossible to determine its exact nature, or whether it is primary or secondary. The occurrence of cough and pain in the chest, fixed to certain spots, generally worse at night, with dulness on percussion, absence of respiratory sound or increased vocal resonance over the seat of the pain, must be particularly when cancer exists in some other part of the body, always be looked upon with suspicion. I have, however, seen the lung break up and cavity form, in cancer of the womb and in cancer of the breast, and yet no cancerous deposit could be found in the lungs after death.

2. *Worms in the Lungs*.—A few cases in which worms were discharged from the lungs may be found scattered in the different European publications. In this colony, sheep are very liable, in wet districts, both to fluke in the liver and to worms in the lungs. They often, in the latter, die when driven fast, the lungs or the bronchial tubes being found full of them. As far as I have been able to learn, they are nearly half an inch in length, white, with black heads. The same kind of worms are often passed by children here who eat raw vegetables or fruit and drink water from shallow pools. The only case that I have met with, in which lung disease was caused, was that of a man suffering from consumption. He stated that he had spat up the same kind of worms as those found in the lungs of sheep. During the time he was under my observation he however brought up no worms. After death, which took place from hæmorrhage, no traces of worms could be found in the lungs. There were, however, several fluke in the liver. Medical men practising in districts where the sheep are liable to fluke in the liver and worms in the lungs, may meet with cases in which there is distinct evidence of the latter being expectorated by people who have drank water from shallow pools.

3. *Bronchial Polypi*.—*Formation of Membranes in the Bronchial Tubes*.—During fourteen years' practice in the colony, I have only seen three cases of this disease. In all the cases, the disease was chronic and the membranes came from the lower divisions of the bronchial tubes. They

presented many of the appearances of empty hydatid cysts on a cursory examination. The most marked symptoms were pain in the part of the tube in which they were forming or had formed, aggravated and attended with slight difficulty of breathing on exertion and cough, more or less dry, followed by the expulsion of a thin tubular-shaped membrane, open at both ends. The expectoration of the membrane was followed by marked relief. In all the cases, as the membrane separated, there was heard in the seat of the alteration, first, harshness, during inspiration and expiration; and then, as the membrane became detached, first, a slight flopping sound, and then as it became looser, as if a plug was driven up and down during inspiration and expiration. In one of the cases no treatment seemed to be of any service. In the other, the change of air to a warmer and drier climate than that of Melbourne seemed to check the formation of the membrane very quickly.

I have seen no case of acute membranous formation in the bronchial tubes in the colony, unless in connection with croup. In several of these cases, the disease had extended from the bronchial tubes up to the trachea and larynx.